PIATTAFORME AEREE SEMOVENTI
SELF-PROPELLED WORK-PLATFORMS
PLATEFORMES DE TRAVAIL AUTOMOTRICES
SELBSTFAHRENDE HUBARBEITSBÜHNEN
PLATAFORMAS ELEVADORAS AUTOPROPULSADAS
ZELFRIJDENDE HOOGWERKERS
SJÄLVGÅENDE ARBETSPLATTFORMAR
SAMOKRETNE RADNE PLATFORME

"SG" SERIES

SG1400-J SG1600-J

USE AND MAINTENANCE MANUAL
- ENGLISH -

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Tigieffe thanks you for purchasing a product of its range, and invites you to read this manual. Here you can find all the necessary information for a correct use of the purchased machine; therefore, you are advised to follow the instructions carefully and to read the manual thoroughly. The manual should be kept in a suitable place where no damage can occur to it. The content of this manual may be modified without prior notice and further obligations in order to add changes and improvements to the units already delivered. No reproduction or translation may take place without the written permission of the owner.

Contents:

1. INTRODUCTION.

This Use and Maintenance Manual provides general instructions concerning the complete range of units indicated on the cover. Therefore the description of their components, as well as control and safety systems, may include parts not present on your unit since supplied on request or not available. In order to keep pace with the technical development *AIRO-Tigieffe s.r.l.* reserves the right to modify the product and/or the use and maintenance manual at any time without updating the units already delivered.

1.1 Legal aspects.

1.1.1 Delivery of the unit.

Within EU (European Union) member countries the machine is delivered complete with:
- Use and Maintenance manual in your language;
- CE mark applied on the unit;
- CE conformity declaration.

It is to be noted that the Use and Maintenance Manual is an integral part of the machine and a copy of this, together with copies of the documents certifying that the periodical checks have been carried out, must be kept on board in its suitable container. In the event of a transfer of property the machine must always be provided with its use and maintenance manual.

1.1.2 Declaration of commissioning, periodical checks and transfers of ownership.

The legal obligations of the owner of the machine vary according to the country of commissioning. It is therefore recommended to inquiry about the procedures in force in your country from the boards responsible for industrial safety. This manual contains a final section called "Control Register" for a better filing of documents and recording of any modifications.

1.1.2.1 Declaration of commissioning.

In ITALY the owner of the Aerial Platform must notify the use of the unit to the local competent ISPESL (National Institute for the prevention of accidents at the workplace). To declare the commissioning of the unit in Italy, send the form together with the other documents issued upon machine delivery, by registered letter with advice of receipt.
ISPESL will assign a Serial Number and depending on their staff availability will issue a "Control booklet" indicating only the detectable data of the machine already in use or inferable from the relative User Manual. Afterwards ISPESL will send a copy of the same booklet to the territorial inspection boards (ASL/USL or ARPA) which carry out the periodical mandatory checks (every year).

1.1.2.2 Periodical checks.

The annual checks are compulsory and must be carried out also when the "Control booklet" is not available. In Italy the owner of the Aerial Platform must apply for a periodical check by sending a registered letter to the local competent inspection board (ASL/USL or ARPA) at least twenty days before the expiry of the year from the purchase date or the last periodical check.

NB: Should a machine without a valid control document should be moved in an area outside the competence of the usual inspection board, the owner of the machine must ask the inspection board, competent for the new territory where the machine is to be used, for the annual check.

1.1.2.3 Transfers of Ownership.

In case of transfer of ownership (in Italy) the new owner of the Aerial Platform must notify the ownership of the unit to the local competent inspection board (ASL/USL or ARPA) by enclosing a copy of:

- Conformity declaration issued by the manufacturer;
- Declaration of commissioning carried out by the first owner.

1.2 Intended use.

The machine described in this use and maintenance manual is a self-propelled aerial platform intended for lifting persons and materials (equipment and building materials) in order to carry out maintenance, installation, cleaning, painting, de-painting, sand-blasting, welding operations, etc.
The max. capacity allowed (which varies according to the model – see paragraph “Technical features”) is divided as follows:

- 80 Kg for each person on board;
- 40 Kg for equipment;
- the remaining load is represented by the material being worked.

In any case NEVER exceed the maximum capacity allowed as indicated in paragraph "Technical features”.
All loads must be positioned inside the basket. Do not lift loads (even if complying with the maximum capacity allowed) hanging from the platform or lifting structure.
Do not carry large-sized panels since they increase the resistance to wind force thus causing the machine to overturn.
While de-placing the unit with lifted platform do not load horizontal loads onto the platform (the operators on board must not pull ropes, wires, etc.).
A load limiter interrupts the operation of the unit if the load on the platform exceeds by 25% the rated load (see chapter "General use instructions”).
The unit cannot be used in areas where road vehicles operate. Always surround the working area by means of suitable signs when the unit is used in public areas.
Do not use the machine to tow trucks or other vehicles.

1.3 Description of the unit.

The machine described in this use and maintenance manual is a self-propelled aerial platform equipped with:

- motorized chassis equipped with wheels;
- hydraulically driven rotating turret;
- articulated boom operated by hydraulic cylinders (the number of articulations and cylinders varies according to machine model);
- operator platform (the max. capacity varies according to the model - see chapter "Technical features”).

The chassis is motorised to allow the machine to move (see "General use instructions"). On 2-driving wheel models the chassis is equipped with two rear driving wheels and two front idle steering wheels. On 4-driving wheel models the chassis is equipped with two rear driving wheels and two front driving and steering wheels. All driving wheels are equipped with hydraulic parking brakes, positive logic type (when drive controls are released brakes are automatically activated).
The hydraulic cylinders which move the articulated structure (except for the basket cylinder rotation and boom inclination sensor cylinder) are provided with over-centre valves directly flanged on the same. These devices allow the booms to remain in position even if one of the supply tubes accidentally breaks.
The platform is equipped with guard-rails and toe-boards of a prescribed height (the height of the guard-rails is $\geq$ 1100 mm; the height of the toe-boards is $\geq$ 150 mm).

1.4 Control stations.

The machine is equipped with two control stations:
- at platform for normal use of the unit;
- at turret (or at ground) for emergency controls to lower or stop the unit in emergency situations. The on-ground control post is also equipped with a key-selector to select the control post and to start the unit.

1.5 Power supply.

The machines can be powered by:
- an electric-hydraulic system composed of rechargeable accumulators and electric pump;
- a heat engine (Diesel engine models are identified by the abbreviation "-D"; petrol engine models are identified by the abbreviation "-B");
- a bi-fuel (electric/thermic) system (bi-fuel Electric/Diesel models are identified by the abbreviation "E/D"; bi-fuel Electric/Petrol models are identified by the abbreviation "E/B").

In any case both the hydraulic and the electric systems are equipped with all necessary protections (see electric and hydraulic circuit diagrams annexed to this manual).

Do not use the machine for purposes different from those it was intended for.
If disposal of the unit is necessary, comply with current local regulations.

1.6 Identification.

In order to identify the machine, when spare parts and service are required, always mention the information given in the serial number plate. Should this plate (as well as the various stickers applied on the unit) be lost or illegible, it is to be replaced as soon as possible. In order to identify the machine when no plate is available the serial number is also stamped on the chassis. To locate the plate and the stamp of the serial number, see the following picture. The main data of the machine which this book refers to is indicated in the following boxes:

Model.....	Chassis:.....	Year:.....

Fig.1

1.7 Location of main components.

Below is a diagram showing the machine and its components.

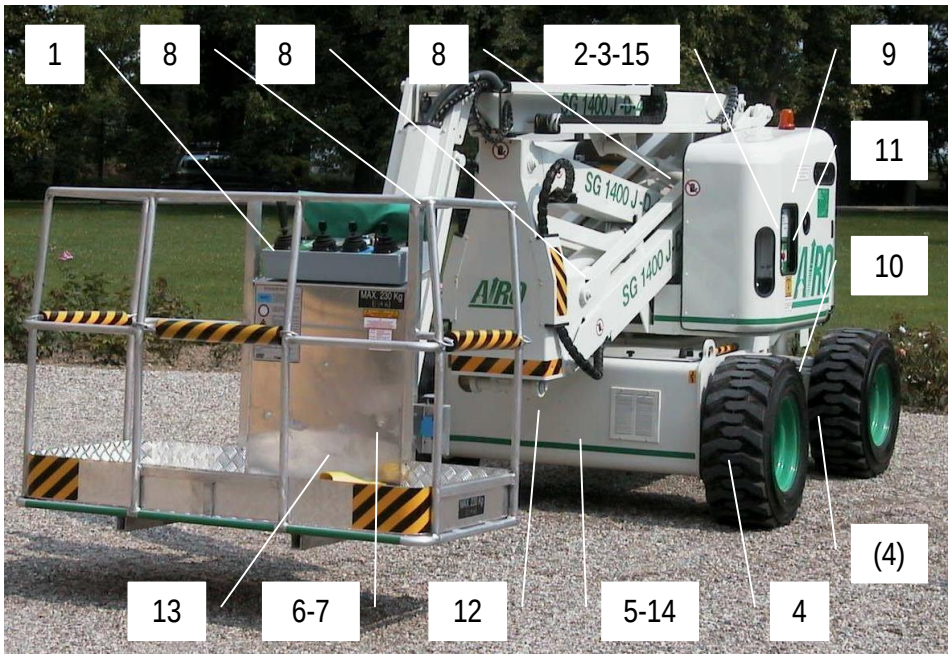


Fig.2

1) Control panel;
2) Electric central unit;
3) Hydraulic central unit;
4) Hydraulic drive motors;
5) Turret rotation hydraulic motor;
6) 220V socket;
7) Bubble level for visual check of machine levelling;
8) Lifting cylinders;
9) Battery;
10) Power steering;
11) Inclinometer;
12) Heat engine fuel tank;
13) Load limiter;
14) Turntable;
15) Control device for electric system isolation (electric machines –E, -E/D only);

2 TECHNICAL FEATURES OF STANDARD MACHINES.

DESCRIPTION	SG1400-J				SG1600-J			
	E	E/D	D-2WD	D-4WD	E	E/D	D-2WD	D-4WD
Max. working height - m -	16	16	16	16	17,8	17,8	17,8	17,8
Max. walking surface height - m -	14	14	14	14	15,8	15,8	15,8	15,8
Max. outreach from turntable centre - m -	8,1	8,1	8,1	8,1	9,9	9,9	9,9	9,9
Turret rotation (not continuous) - degrees -	360	360	360	360	360	360	360	360
Platform rotation - degrees -	140	140	140	140	140	140	140	140
Max. platform dimensions - mm -	800x1700	800x1700	800x1700	800x1700	800x1700	800x1700	800x1700	800x1700
Max. capacity - Kg -	230 (*)	230 (*)	230 (*)	230 (*)	230 (*)	230 (*)	230 (*)	230 (*)
Max. No. of people on platform	2	2	2	2	2	2	2	2
Machine weight (unloaded) - Kg -	7300	7600	----	7160	8250	8140	----	8100
Max. load on each wheel - kg -	3200	3200	----	3200	3500	3500	----	3500
Volume - m^3 -	19,3	19,3	----	22,3	22,5	22,5	----	26,3
Max. hydraulic pressure - bar -	230	230	230	230	230	230	230	230
Tyre dimensions - mm -	Ø 730x230	Ø 730x230	Ø 730x230	Ø 800x320	Ø 730x230	Ø 730x230	Ø 730x230	Ø 800x320
Tyre type	10x16,5 (1)	10x16,5 (1)	10x16,5 (1)	12x16,5 (2)	10x16,5 (1)	10x16,5 (1)	10x16,5 (1)	12x16,5 (2)
Max. operating temperature - °C -	+50°	+50°	+50°	+50°	+50°	+50°	+50°	+50°
Min. operating temperature - °C -	-5°	-5°	-5°	-5°	-5°	-5°	-5°	-5°
Stability limits:								
Longitudinal inclination - degrees -	3°	3°	4°	4°	3°	3°	4°	4°
Transversal inclination - degrees -	3°	3°	4°	4°	3°	3°	4°	4°
Max. wind force (**) - m/s -	12,5	12,5	12,5	12,5	12,5	12,5	12,5	12,5
Battery power								
Battery voltage and capacity -V/Ah -	48/450	48/350 (3)	----	----	48/450	48/350 (3)	----	----
Battery weight - kg -	2x400	2x350	----	----	2x400	2x350	----	----
Single-phase battery charger - V/A -	48/60	48/45	----	----	48/60	48/45	----	----
Max. power absorbed by battery charger -A-	19,5	15	----	----	19,5	15	----	----
Max. capacity - KW -	4,5+4,5	4,5+4,5	----	----	4,5+4,5	4,5+4,5	----	----
Power voltage motor 1 - V -	48	48	----	----	48	48	----	----
Max. absorbed current - A -	160	160	----	----	160	160	----	----
Motor power 1 - kW -	4,5	4,5	----	----	4,5	4,5	----	----
Power voltage motor 2 - V -	48	48	----	----	48	48	----	----
Max. absorbed current - A -	160	160	----	----	160	160	----	----
Motor power 2 - kW -	4,5	4,5	----	----	4,5	4,5	----	----
Max. drive speed – m/s -	1,1	1,1	----	----	1,1	1,1	----	----
Min. drive speed - m/s -	0,2	0,2	----	----	0,2	0,2	----	----
Oil tank capacity - l -	104	104	----	----	104	104	----	----
220 V electric pump power (optional on diesel models)								
Max. capacity - KW -	----	----	----	2.2	----	----	----	2.2
Max. absorbed current - A -	----	----	----	13.9	----	----	----	13.9
Max. drive speed - m/s -	----	----	----	----	----	----	----	----
Min. drive speed - m/s -	----	----	----	----	----	----	----	----
Max. gradeability - % -	----	----	----	----	----	----	----	----
Machine weight (unloaded) - Kg -	----	----	----	7200	----	----	----	8140

Description	SG1400-J				SG1600-J			
	E	E/D	D-2WD	D-4WD	E	E/D	D-2WD	D-4WD
Diesel engine (model E/D)								
Diesel engine type	----	Hatz 1D81C	----	----	----	Hatz 1D81C	----	----
Max. engine power -KW -	----	10	----	----	----	10	----	----
Starter battery –V/Ah-	----	12/132	----	----	----	12/132	----	----
Max. drive speed - m/s -	----	1,1	----	----	----	1,1	----	----
Min. drive speed - m/s -	----	0,2	----	----	----	0,2	----	----
Oil tank capacity - l -	----	104	----	----	----	104	----	----
Diesel oil tank capacity - l -	----	20	----	----	----	20	----	----
Max. gradeability - % -	----	25	----	----	----	25	----	----
Petrol engine (model E/B)								
Engine type	----	----	----	----	----	----	----	----
Max. engine power - kW -	----	----	----	----	----	----	----	----
Starter battery –V/Ah-	----	----	----	----	----	----	----	----
Max. drive speed - m/s -	----	----	----	----	----	----	----	----
Min. drive speed - m/s -	----	----	----	----	----	----	----	----
Oil tank capacity - l -	----	----	----	----	----	----	----	----
Petrol tank capacity - l -	----	----	----	----	----	----	----	----
Max. gradeability - % -	----	----	----	----	----	----	----	----
Diesel engine (model D) - HATZ								
Engine type	----	----	2L41C	3L41C	----	----	2L41C	3L41C
Max. engine power - kW -	----	----	24	36	----	----	24	36
Starter battery –V/Ah-	----	----	12/132	12/132	----	----	12/132	12/132
Max. drive speed - m/s -	----	----	1,3	1,3	----	----	1,3	1,3
Min. drive speed - m/s -	----	----	0,2	0,2	----	----	0,2	0,2
Oil tank capacity - l -	----	----	104	104	----	----	104	104
Diesel oil tank capacity - l -	----	----	45	45	----	----	45	45
Max. gradeability - % -	----	----	25	40	----	----	25	40
Diesel engine (model D) - ISUZU								
Engine type	----	----	3LD1	4LE1	----	----	3LD1	4LE1
Max. engine power - kW -	----	----	24,8	39	----	----	24,8	39
Starter battery –V/Ah-	----	----	12/132	12/132	----	----	12/132	12/132
Max. drive speed - m/s -	----	----	1,3	1,3	----	----	1,3	1,3
Min. drive speed - m/s -	----	----	0,2	0,2	----	----	0,2	0,2
Oil tank capacity - l -	----	----	104	104	----	----	104	104
Diesel oil tank capacity - l -	----	----	45	45	----	----	45	45
Max. gradeability - % -	----	----	25	40	----	----	25	40

(*) In some cases different limits can be fixed. It is recommended to comply with the data shown on the machine plate.
(**) Wind speeds higher or equal to 12,5 m/s indicate that the machines can also be used outside; Wind speeds equal to 0 m/s indicate that the machines can be used INSIDE ONLY.

1) Standard grip tyres 10x16,5 filled with polyurethane foam; Optional grip tyres 12x16,5 filled with polyurethane foam; Optional extra flexible tyres 250-15.
2) Standard grip tyres 12x16,5 filled with polyurethane foam; Optional grip tyres 10x16,5 filled with polyurethane foam; Optional extra flexible tyres 250-15.
3) Standard; optional 48V 455Ah batteries.

Noise tests have been carried out under the most unfavourable conditions to study the effects on the operator.

- ELECTRICAL MODELS: The level of acoustic pressure weighed (A) at work places does not exceed 70dB(A).
- MODELS WITH HEAT ENGINE: The level of acoustic pressure weighed (A) at work places does not exceed 106dB(A); the level of acoustic pressure at ground control station does not exceed 85dB(A); the level of acoustic pressure at platform control station does not exceed 78bD(A).

As to vibrations in ordinary working conditions:

- the rms. value weighed according to acceleration frequency relevant to the upper limbs is lower than 2.5 m/sec^2 ;
- the rms. value weighed according to acceleration frequency relevant to the body is lower than 0.5 m/sec^2 .

3 SAFETY PRECAUTIONS.

3.1 Power supply.

The electric and hydraulic circuits are provided with safety devices, calibrated and sealed by the manufacturer.

⚠ Do not tamper with and modify the calibration of any component of the electric and hydraulic system.

3.2 Work and maintenance rules.

- Always wear personal protective clothes according to current regulations concerning industrial health and safety (in particular, helmet and safety harness are COMPULSORY. See picture below).
- The machine should be used in areas well lit up, checking that the ground is flat and firm. The machine may not be used if the lighting conditions are not sufficient.
- Do not use the thermic power (Diesel or Petrol engine) indoors or in insufficiently ventilated areas.
- Before using the machine check its integrity and conservation state.
- During maintenance operations do not dispose of any waste materials in the environment, but comply with current regulations.
- Do not carry out any service or maintenance operations when the machine is connected to the power supply. Follow the instructions given in the following paragraphs.
- For the maintenance of the heat engine (Diesel or Petrol engine) supplement the instructions given in this manual with those given in the heat engine manual.
- Do not approach the electric and hydraulic system components with sources of heat or flames.
- The platform is intended for people carriage; therefore comply with the current local regulations relevant to this class of machines.
- Do not increase the max. allowed height by means of scaffolds, ladders or other.
- Do not use the machine as a crane.
- Do not use the machine as a hoist and/or lift.
- Protect the unit (in particular the platform control switchboard) and the operator when working in adverse environmental conditions (painting, de-painting, sand-blasting, washing, etc.).
- It is forbidden to use the unit in case of severe weather conditions (rainstorms with wind exceeding the limit speed indicated in chapter "Technical features").
- In the event of rain or in parking condition always protect the on-platform control panel by means of the specially provided cap.
- Do not use the machine in areas where risks of fire or explosion exist.
- Do not use pressurized water jets (high-pressure cleaners) to wash the machine.

Fig.3

3.3 Safety rules.

3.3.1 General.

Only adults, after carefully reading this manual, should use the machine.

This machine must be used at a distance of at least 5 metres from high-tension lines (in any case not in proximity to live elements).

Use the machine according to the capacity values indicated in the technical features section. The max. No. of people allowed on the platform and the capacity are specified on the identification plate.

It is absolutely forbidden to load persons, tools and building materials on the platform when it is not in access position.

Do NOT use the framework of the platform or any of its elements for grounding connection while welding on platform.

It is the machine owner and/or safety manager's responsibility to check that the operators have been thoroughly trained in the use of the machine.

It is the machine owner and/or safety manager's responsibility to check that the maintenance and repair operations are carried out by skilled personnel.

3.3.2 Handling.

Before any movement make sure that the machine plugs are disconnected from the power source. Always check the cable position during handling if the machine is powered with a 220V electric pump.

In order to avoid any instability, use the machine on regular and firm grounds. Before lifting the platform check the platform level through the spirit level which is located on the platform.

To prevent the machine from overturning, comply with the max. gradeability values indicated in the Technical features section under paragraph "Stability limits". However, movements on inclined grounds are to be carried out with the utmost caution.

As soon as the platform is lifted (the tolerance varies according to the model) the safety drive speed is automatically activated.

Drive the unit with lifted platform only on flat grounds, verifying the absence of holes or steps on the floor and bearing in mind the overall dimensions of the unit.

While driving the unit with lifted platform the operators are not allowed to place horizontal loads onto the platform (operators on board must not pull ropes, wires, etc.).

The machine must not be used directly for road transport. Do not use it for material transport (see paragraph 1.2 "Intended use").

Check that in the operating area there are not obstacles or other dangerous elements.

Pay particular attention to the area above the machine during lifting to avoid any crushing and collisions.

3.3.3 Operating procedures.

The machine is equipped with a load-on-platform control system stopping the platform in case of overloading. Platform operation can be resumed only after removing the exceeding load. Should the audible warning device and the red light located on the platform control panel turn on, then the machine is overloaded (see paragraph relevant to general use instructions). Remove the exceeding load before starting operations again.

The machine is equipped with a chassis inclination control system disabling lifting operations in case of unstable positioning. Working operations can be resumed only after placing the machine in a steady position. Should the audible device and the red light on the platform control panel turn on, the machine is not correctly positioned (see paragraphs relevant to general use instructions). Bring it to safety rest position before starting operations again.

Electric power machines are equipped with a device controlling the electric system isolation. In case of isolation loss or remote switch fault, such device (located on the chassis or on the turret – see paragraph "Location of main components") brings the machine to a complete halt and signals the fault by means of a continuous hissing sound.

Do not lean over the platform guard-rails. Avoid severe weather conditions and, in particular, windy days.

During operations in public areas, in order to prevent people other than the personnel from approaching the machine and being endangered, surround the working area by means of barriers or other suitable signs.

Do not use the thermic power (Diesel or Petrol engine) indoors or in insufficiently ventilated areas.

Make sure that no people, apart from the operator, are in the area where the machine is operating. While moving the platform the operator should pay particular attention to avoid any contact with the personnel on the ground.

Lift the platform only if the machine is resting on solid and horizontal surfaces.

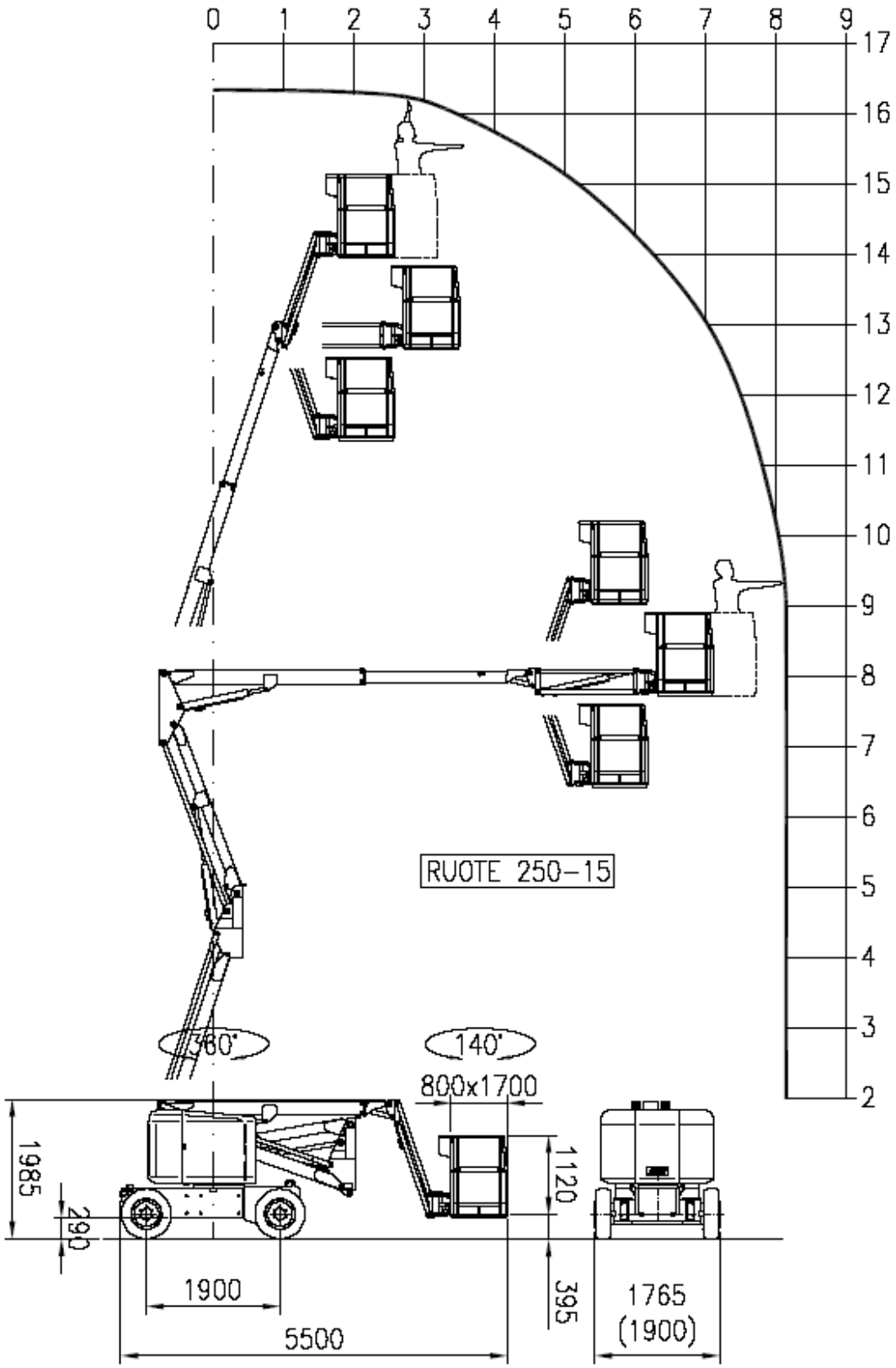
Drive the machine with lifted platform only if the ground is solid and horizontal.

After each work session, always take the key out of the control panel and keep it in a safe place to prevent unauthorized people from using the machine.

Always place working tools in a steady position to prevent them from falling and hurting the operators on the ground.

- From the following pictures you can locate the action range of the platform while the chassis is kept in a fixed position. Watch these pictures carefully in order to position the chassis so as to avoid any contacts with obstacles present in the action range.

SG 1400-J-E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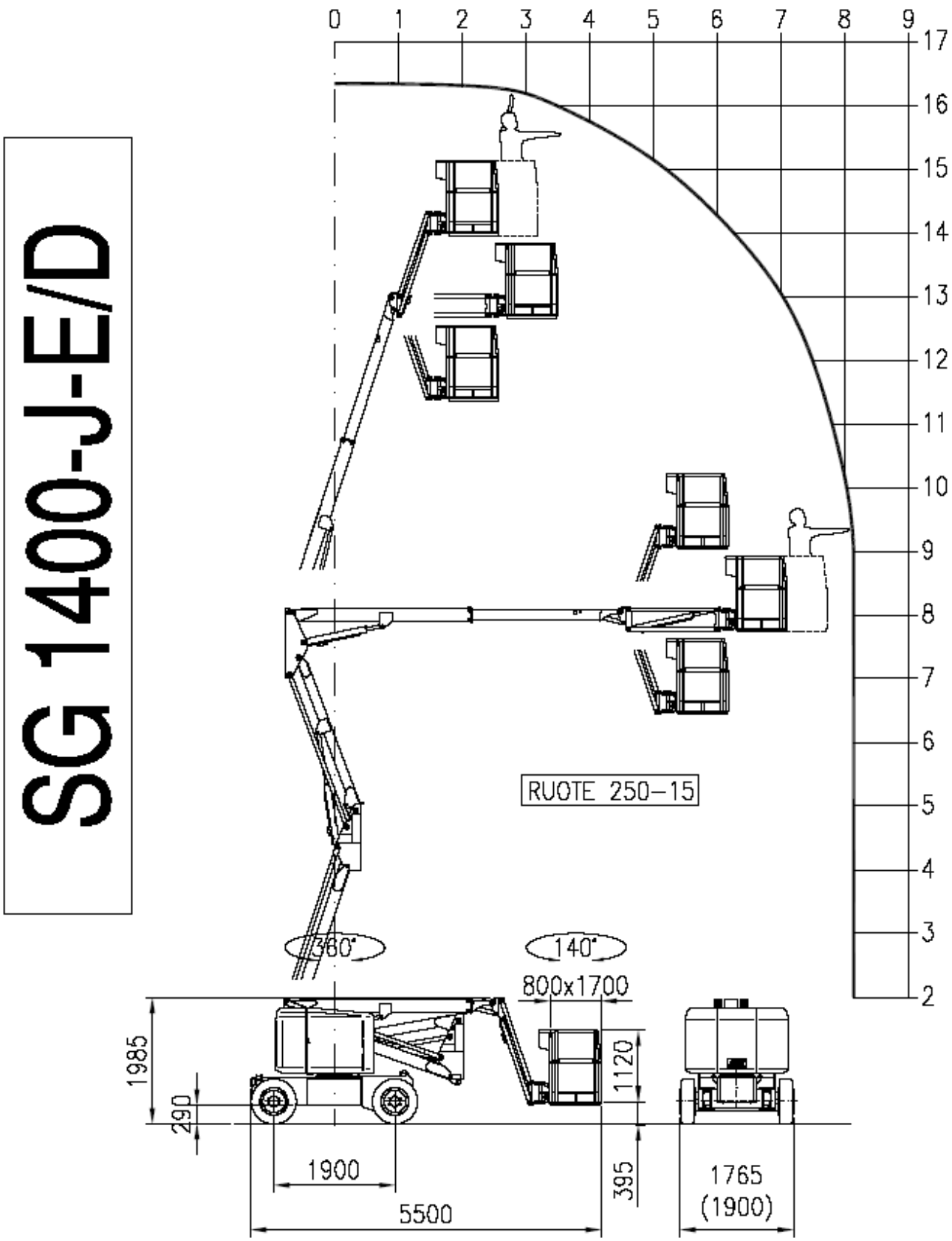
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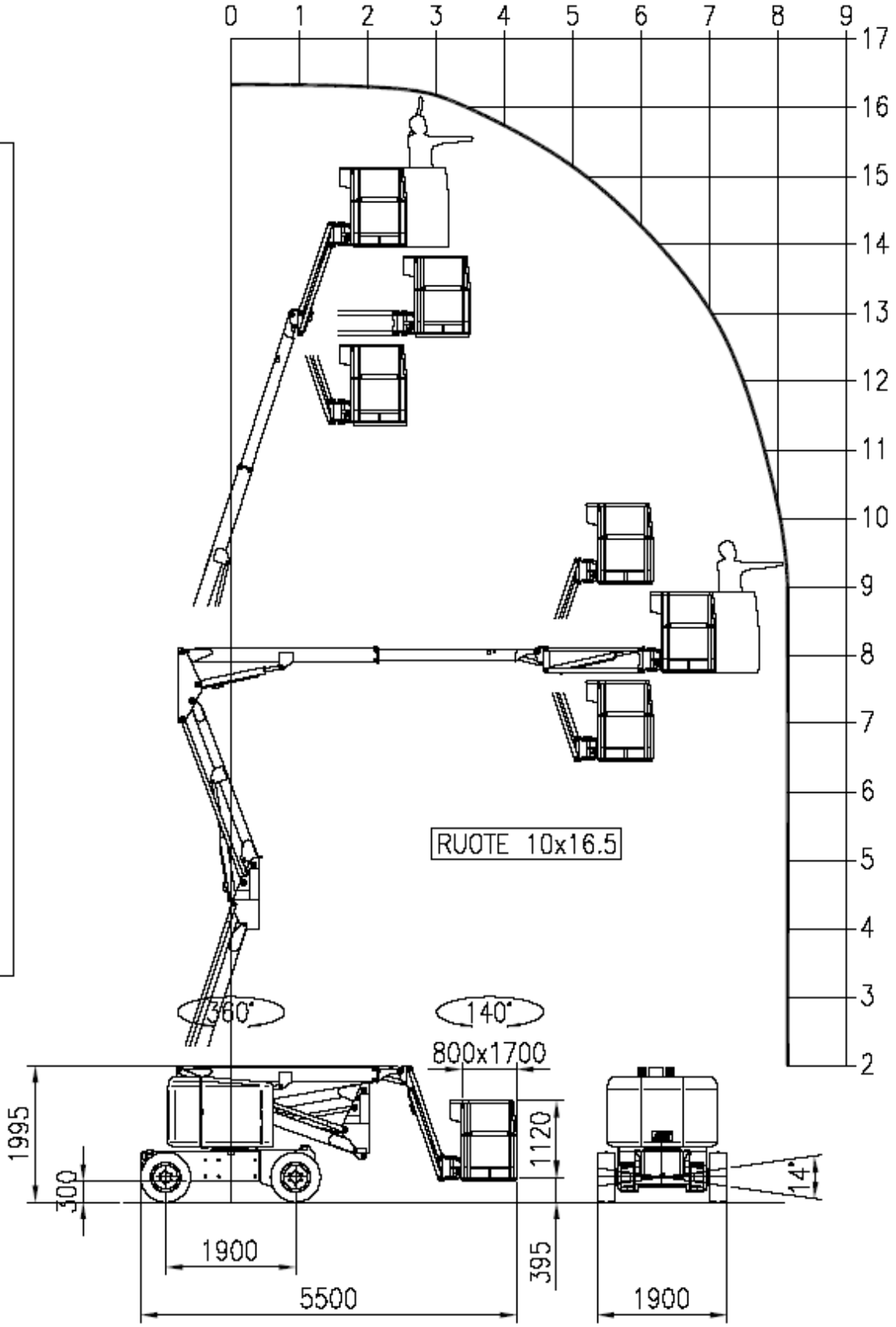

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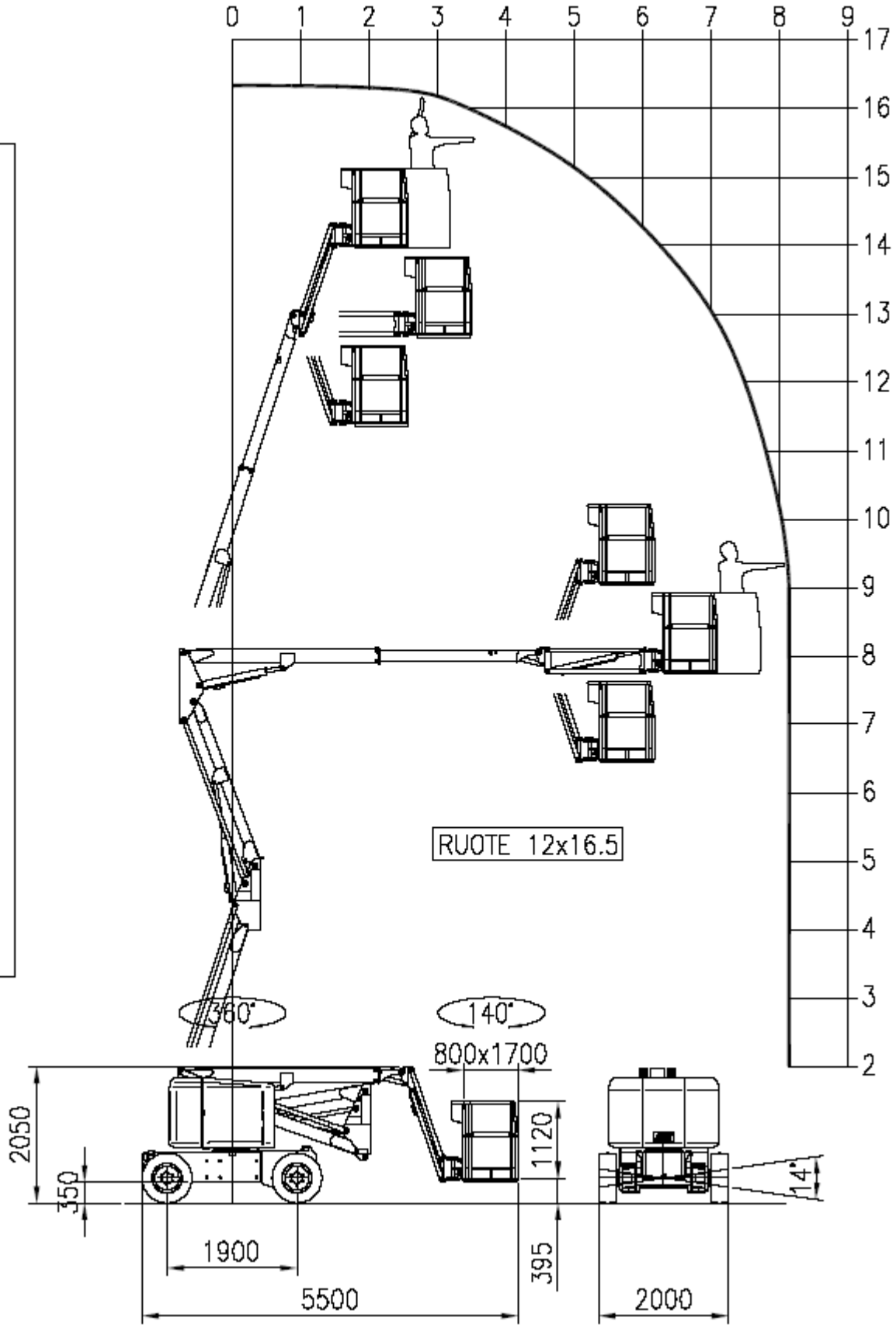

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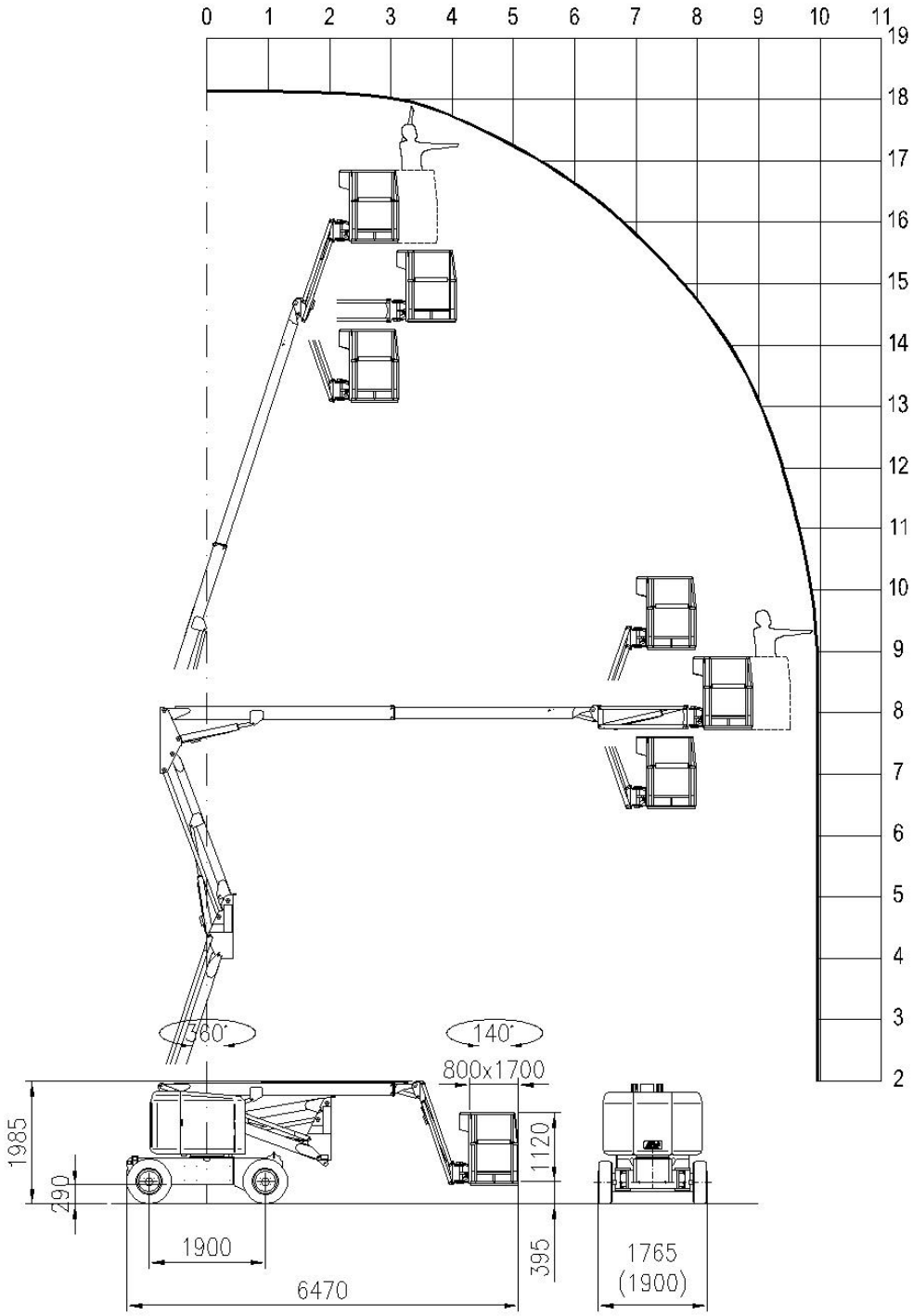
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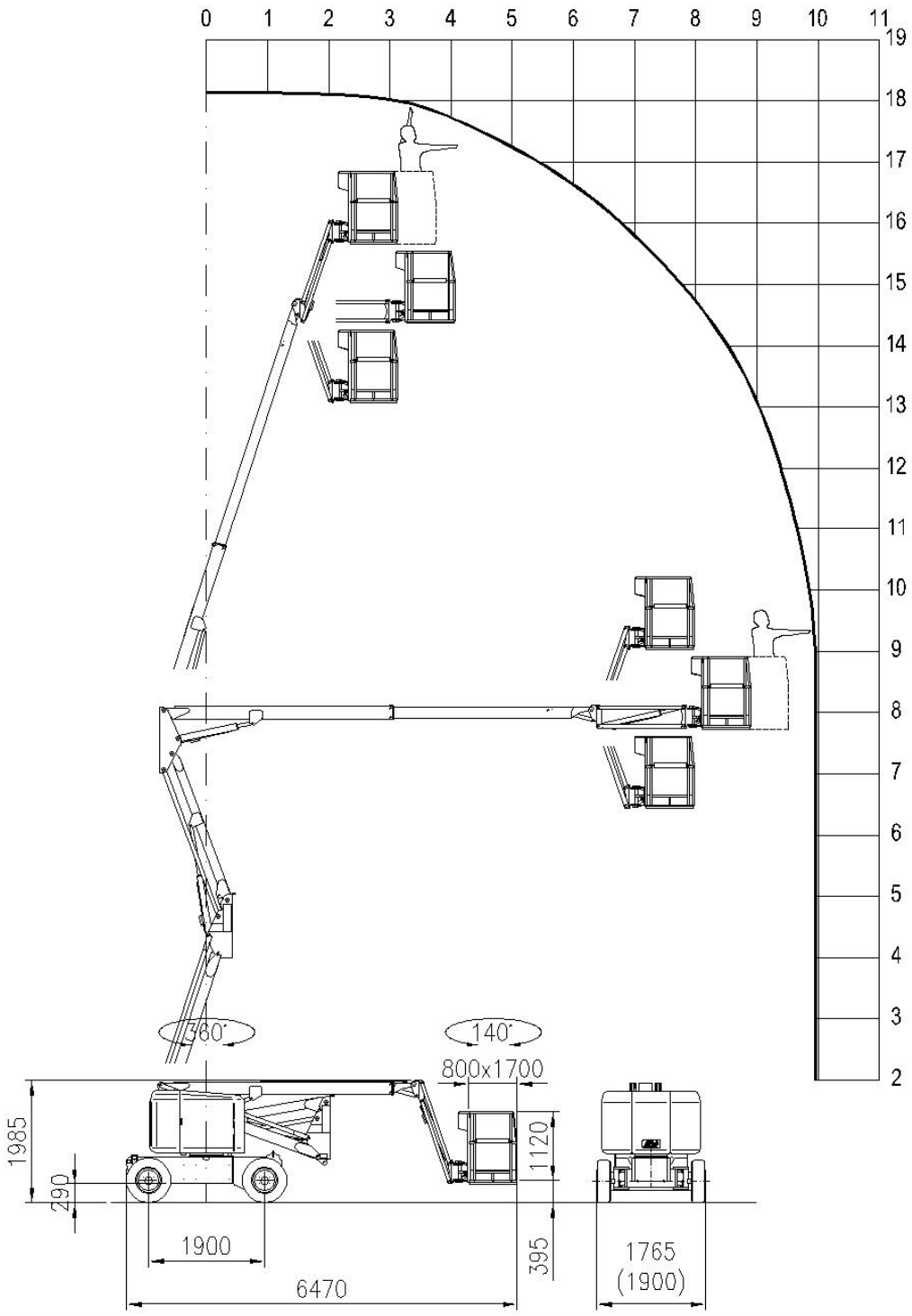
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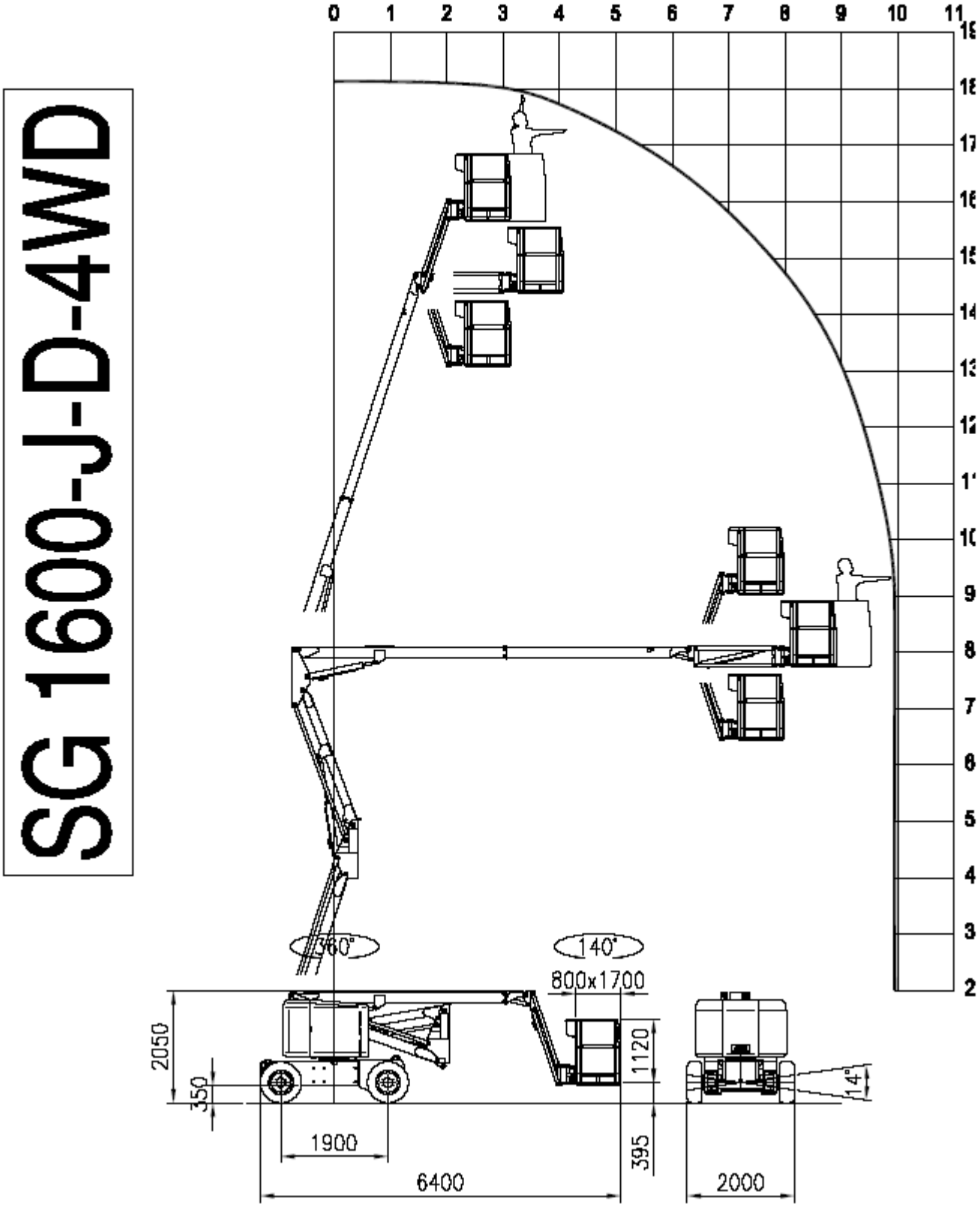


4 INSTALLATION AND PRELIMINARY CHECKS.

The machine is supplied completely assembled, therefore it can perform all functions in full safety as provided for by the manufacturer. No preliminary operation is required. To unload the machine, follow the instructions in paragraph "Handling and carrying".
Place the machine onto a firm ground and with a gradeability lower than the max. allowed (see "Stability limits"). The machine is equipped with platform bubble level for visual check and an inclinometer on the chassis (or turret) to always check machine levelling, both transversal and longitudinal.
Before using the machine read the instructions given in this manual and the concise instructions indicated on the platform plate.
Before starting any operations verify the integrity of the unit (by means of a visual check) and read the plates indicating the operating limits.

4.1 Before using the machine.

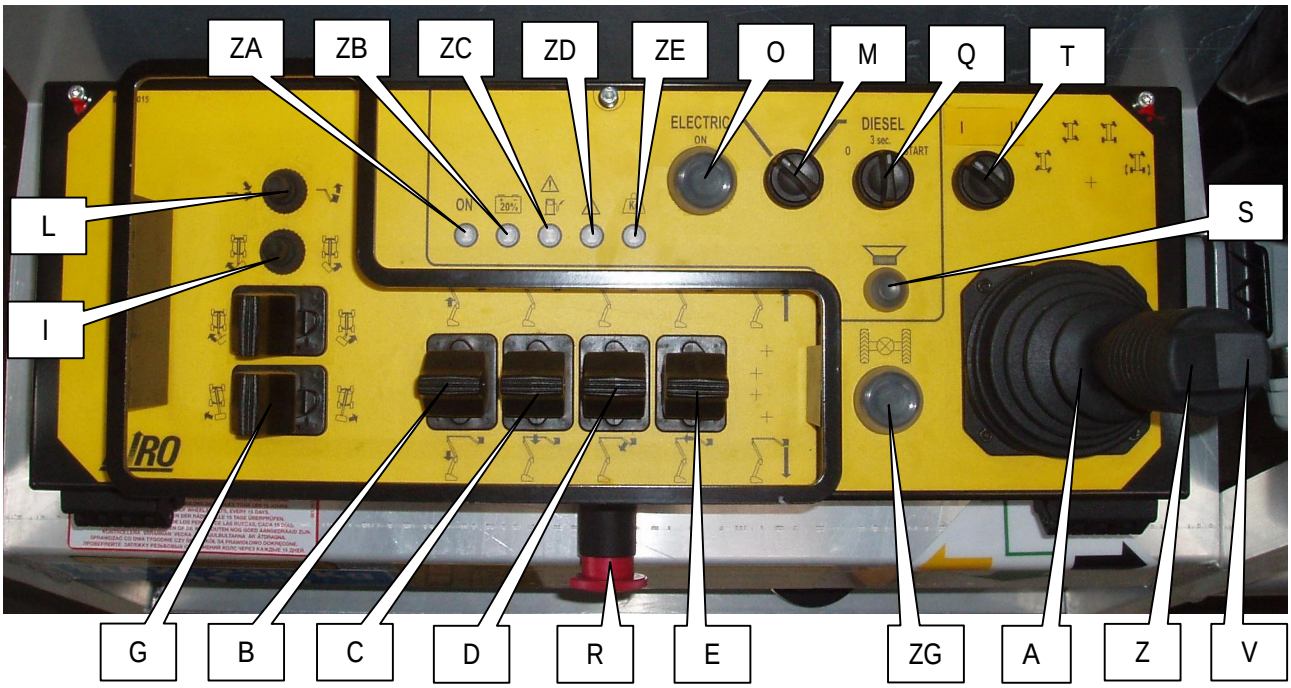
Before using the machine the operator must <u>always</u> check visually that:

- the battery is completely charged;
- the oil level lies between the min. and max. value (with lowered platform);
- the machine carries out all operations in safety;
- the wheels and drive engines are properly fixed;
- the wheels are in good condition;
- the guardrails are fixed to the platform and the self-closing gates are present;
- the structure does not show clear faults (check welding of lifting structure);
- the instructions plates are perfectly readable;
- the controls are perfectly efficient both at platform and at emergency ground control station, including the "dead-man" system.

5 GENERAL USE INSTRUCTIONS.

Before using the machine read this chapter thoroughly.

5.1 Platform control panel.



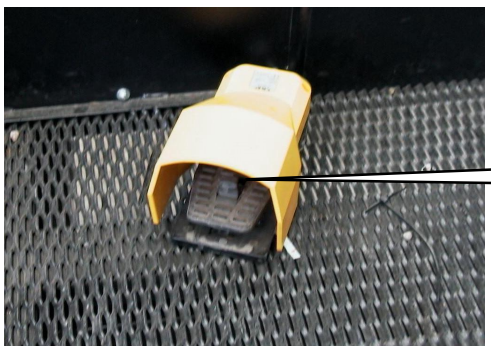


fig. 6

A) Drive proportional joystick control
B) Proportional lever control scissors up/down
C) Proportional lever control boom up/down
D) Proportional lever control jib up/down
E) Proportional lever control telescopic boom out/in
G) Proportional lever control turret rotation
I) Platform rotation switch
L) Platform level switch
M Diesel/electric power selector - OPTIONAL-
O) Starting button for 24V (Battery) or 380V (three-phase mains) electric pump - OPTIONAL -
P) Warning light electric pump on - OPTIONAL -
Q) Starting switch Diesel motor
R) Emergency stop button
S) Manual horn
T) Drive speed selector
V) Right steering switch
Z) Left steering switch
ZA) Warning light control station enabled
ZB) Warning light discharged battery – models –E
ZC) Warning light fault Diesel engine / low fuel level – models -D
ZD) Danger warning light
ZE) Overload warning light
ZF) Dead-man pedal
ZG) Differential locking button (OPTIONAL)

All movements (except for platform rotation and platform level compensation) are controlled by proportional joystick /levers; it is therefore possible to adjust movement speed by means of the relative controls. To avoid sudden shakes during movements, it is advisable to operate the proportional joystick controls gradually.

For safety reasons, to operate the machine, it is necessary to press the platform dead-man pedal ZF. If the dead-man pedal is accidentally released while the machine is operating, the movement is immediately stopped.

CAUTION! Holding down the dead-man pedal for over 10 seconds without carrying out any operation will disable the control station. This condition is signalled by a flashing green led (Z). To operate the machine again it is necessary to release the pedal and press it again; the green led (Z) will light up steady and for the next 10 seconds all controls will be enabled.

Follow exclusively the instructions given in the next paragraphs and the safety rules described both hereafter and in the previous paragraphs. Read the next paragraphs carefully in order to properly understand the on/off procedures as well as all operations and their correct use.

Before any movement, verify the presence of people in close proximity to the machine and, in any case, proceed with the utmost caution.

5.1.1 Drive and steering.

5.1.1.1 Drive.

To drive the machine it is necessary to carry out the following operations in sequence:

a) press the dead-man pedal located on the platform; the green led ZA will light up steady indicating its enabling;
b) within 10 seconds from the green steady led lighting up, set the proportional joystick control A forward for forward drive or backward for reverse drive.

WARNING!!
In standard machines the drive and steering controls can be executed simultaneously but they are interlocked with the platform movement controls (lifting/lowering/rotations) except four wheel drive Diesel machines (D-4WD) where with platform lowered (booms down, telescopic boom retracted, jib at height from +10° to –70°) only simultaneous drive-steering- turret orientation is allowed to help machine positioning in narrow places.

In machines with simultaneous controls (OPTIONAL) the drive and steering controls can be executed simultaneously but they are interlocked with the platform movement controls (lifting/lowering/rotations) as previously; on the other hand the simultaneous drive-steering-orientation with platform lowered (booms down, telescopic boom retracted, jib at a height from +10° and -70°) is allowed in all three versions (electric –E, electro-diesel –E/D and four wheel drive diesel – D-4WD).

With platform lowered (booms down, telescopic boom in, jib at a height between +10° and –70°) it is possible to select different drive speeds by means of the speed selector T.

NOTE: To achieve maximum drive speed, set the speed selector (T) to position (III) , and press down the proportional joystick (A) and hold down the differential locking button (ZG-OPTIONAL).
To operate on high ascending slopes (e.g. while loading the machine onto a truck) set the speed selector (T) to position (II).
To operate on high descending slopes (e.g. while unloading the machine from a truck) and get the minimum speed with lowered platform, set the speed selector (T) to position (I).

With platform lifted the safety drive speed is automatically activated.

IT IS FORBIDDEN to drive the unit when the platform is lifted unless the ground is flat and steady.

5.1.1.2 Steering.

To steer, press the buttons V / Z located on the drive proportional joystick control (press the right button for right steering and vice versa). Also the steering control is enabled by the “dead-man” pedal and it is possible only if the green led ZA is lit up steady.

WARNING!!
In standard machines the drive and steering controls can be executed simultaneously but they are interlocked with the platform movement controls (lifting/lowering/rotations) except four wheel drive Diesel machines (D-4WD) where with platform lowered (booms down, telescopic boom retracted, jib at height from +10° to –70°) only simultaneous drive-steering- turret orientation is allowed to help machine positioning in narrow places.

In machines with simultaneous controls (OPTIONAL) the drive and steering controls can be executed simultaneously but they are interlocked with the platform movement controls

(lifting/lowering/rotations) as previously; on the other hand the simultaneous drive-steering-orientation with platform lowered (booms down, telescopic boom retracted, jib at a height from +10° and -70°) is allowed in all three versions (electric –E, electro-diesel –E/D and four wheel drive diesel – D-4WD).

With platform lifted the safety drive speed is automatically activated.

5.1.2 Platform positioning.

To carry out all movements other than drive, use proportional levers B, C, D, E, G and switches I and L.
To achieve the movement it is necessary to carry out the following operations in sequence:

a) press the dead-man pedal located on the platform; the green led ZA will light up steady indicating its enabling;
b) within 10 seconds from the green steady led lighting up set the proportional joystick control or the desired switch in the direction shown by the serigraphy on the control panel.

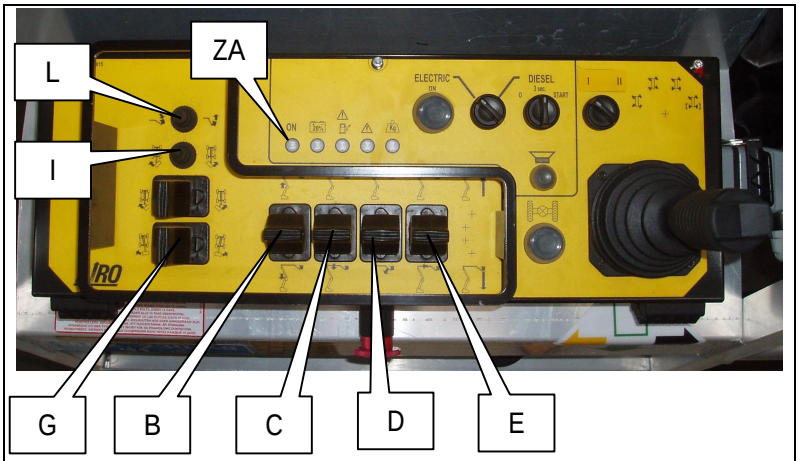


Fig.7

NOTE: before activating the proportional joystick control or the desired switch the dead-man pedal must be pressed.
Release the dead-man pedal and the manoeuvre will be immediately stopped.

⚠	On standard machines, electric (-E) and electro-diesel (-E/D) versions, all platform position controls can be executed only individually and are interlocked with drive and steering controls. On standard machines, 4 wheel drive version (D-4WD), all platform position controls can be executed only individually whilst the turret orientation can be executed together with the drive and steering control with platform lowered (booms down, telescopic boom retracted, jib at a height from +10 and -70°). On machines with simultaneous controls (OPTIONAL), in all three versions (electric-E, electro-diesel -E/D and 4 wheel drive diesel D-4WD) the platform position controls can be executed simultaneously (unless otherwise indicated), and the turret orientation can be executed together with the drive and steering controls with platform lowered (booms down, telescopic boom retracted, jib at a height from +10° to -70°).

5.1.2.1 Scissors (first boom) lifting/lowering.

To lift/lower the scissors (first boom), use the proportional lever B.
Set the proportional lever B forward to lift the scissors, or backward to lower the scissors.

5.1.2.2 Second boom lifting/lowering.

To lift / lower the second boom, use the proportional lever C.
Set the proportional lever C forward to lift, or backward to lower the second boom.

5.1.2.3 Jib lifting/lowering.

To lift/lower the JIB, use the proportional lever D.
Set the proportional lever D forward to lift the jib, or backward to lower the jib.

5.1.2.4 Telescopic boom extraction/retraction.

To extend / retract the telescopic boom, use the proportional lever E.
Set the proportional lever E forward for extraction or backward for retraction.

⚠	On machines with simultaneous controls (OPTIONAL) this movement cannot be executed together with the turret orientation.

5.1.2.5 Turret orientation (rotation).

To carry out the turret orientation (rotation), use the proportional lever G.
Set the proportional lever G to the right to rotate the turret to the right, or to the left to rotate it to the left.

⚠

Before carrying out this manoeuvre make sure that the mechanical lock device of the turret - if any - be deactivated (see chapter 6 “handling and transport”).

On machines with simultaneous movements (OPTIONAL) this movement cannot be executed together with the telescopic boom extraction/retraction.

In standard machines the drive and steering controls can be executed simultaneously but they are interlocked with the platform movement controls (lifting/lowering/rotations) except four wheel drive Diesel machines (D-4WD) where with platform lowered (booms down, telescopic boom retracted, jib at height from +10° to -70°) simultaneous drive-steering- turret orientation is allowed to help machine positioning in narrow places.

In machines with simultaneous controls (OPTIONAL) the drive and steering controls can be executed simultaneously but they are interlocked with the platform movement controls (lifting/lowering/rotations) as previously; on the other hand the simultaneous drive-steering-orientation with platform lowered (booms down, telescopic boom retracted, jib at a height from +10° and -70°) is allowed in all three versions (electric –E, electro-diesel –E/D and four wheel drive diesel – D-4-WD).

5.1.2.6 Platform rotation.

To rotate the platform, use the switch I. Set the switch I to the right for right rotation, or to the left for left rotation.

5.1.2.7 Platform levelling.

The platform is automatically levelled. Should it be necessary to reset the correct level, use switch L.
Set switch L to the left for backward levelling, or to the right for forward levelling. This manoeuvre does not work while other manoeuvres are taking place.

⚠

Warning!! This operation can be carried out only when booms are completely lowered. No result is achieved if these operations are carried out when the platform is lifted.
Both on standard machines and machines with simultaneous controls (OPTIONAL), this operation cannot be executed together with any other ones.

5.1.3 Other functions of the platform control panel.

5.1.3.1 Selection of electric/thermic propulsion (OPTIONAL).

On some models it is possible to select the type of propulsion using the selector M. Set it to position Electric to use the electric propulsion (12V battery or 48V for E/D models, for emergency boom operations or 380V three-phase / 220V single-phase for boom work operations - OPTIONAL); set it to position Thermic to use the thermic propulsion.

5.1.3.2 Starting button for 12V (Battery) or 220V, 380V (mains) electric pump - OPTIONAL -

The button O starts:
- The 12V electric pump for emergency operations (excepting drive and steering);
- The 220V single-phase for platform movement (excepting drive and steering) the ground electric panel is connected to the electric mains.
- The 380V three-phase for platform movement (excepting drive and steering) tthe ground electric panel is connected to three-phase electric mains.

See next paragraphs for operations modes of the starting button of the electric pump.

CAUTION! The power by the 12V emergency electric pump is only for platform recovering in case of faults in the main powers. Do not use it during normal work operations.

5.1.3.3 Heat engine starting button ("E/D", "D" models).

It starts the heat engine (Diesel) on bi-fuel models ("E/D") and on thermic propulsion models ("D").
- In START position it enables starting;
- In position 3 sec it pre-heats the plugs (motors with plugs only);
- In position 0 it stops the heat engine.

5.1.3.4 Manual horn.

It warns that the machine is moving. It is manually operated by means of the press-button S.

5.1.3.5 Emergency stop button.

By pressing button R all control functions are interrupted. Normal functions are enabled by rotating the button of 1/4 turn clockwise.

5.1.3.6 Warning lights.

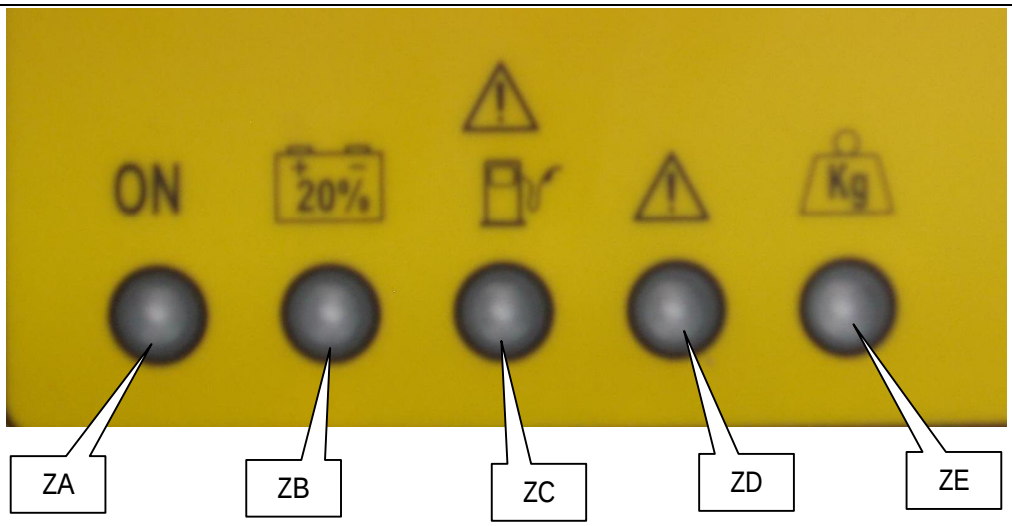


fig.8

5.1.3.6.1 Green warning light control station enabled (ZA).

On with flashing light when the machine is turned on. If the platform control station has been selected and this light flashes the controls are not enabled because the dead-man pedal is not pressed or it was pressed for more than 10 seconds and no operation was performed.
On steady with machine on and dead-man pedal pressed for less than 10 seconds. With platform controls all controls are enabled (unless other types of warning show up – see next paragraphs).

5.1.3.6.2 Red warning light discharged battery (ZB) – electric models only.

Flashing when the battery charge is at 20% (only models "E" or "E/D" with current continuous electric pump). In this condition lifting and telescopic boom extraction are disabled. It is necessary to recharge battery immediately.

5.1.3.6.3 Red warning light anomaly in Diesel engine / low fuel (ZC).

This warning light indicates malfunctioning of diesel engine or low fuel.
On steady with: machine on; platform controls; Diesel power selected. Diesel engine off, ready for start-up. Insufficient engine oil pressure.
Slow flashing in the event of the engine head overheating. If on, it stops the Diesel motor; if off, it prevents the Diesel motor from starting.
Fast flashing in the event of low fuel (approx. 10 litres of fuel left). This warning is active only with the engine on.

Double fast flashing when the fuse on the electric fan of the air/oil exchanger (if present) is burnt out. CAUTION! Change the fuse. Danger of overhearing of hydraulic oil.

5.1.3.6.4 Red warning light danger (ZD).

It flashes quickly for 4 seconds together with the acoustic alarm at the machine start-up in case of fault during safety test on controls (pedal, joystick control, switches, etc).
It is lit up steady together with the acoustic alarm when the chassis inclination exceeds the allowed value. All lifting operations and telescopic extraction are inhibited (except JIB lifting). If the machine is lifted, drive is also blocked. It is necessary to lower the booms completely and then place the machine onto a flat surface.

CAUTION! The activation of this indicator warns of a dangerous situation since the machine or the platform have reached a dangerous inclination level for the machine stability.
When the chassis inclination exceeds the allowed value, to prevent increasing the overturn risk, the operator on the platform is recommended to retract the telescopic boom first and to lower it as the last operation.

5.1.3.6.5 Red warning light overload (ZE).

On steady and activation of acoustic alarm with a platform overload exceeding 25% the rated load. If the platform is lifted, the machine is completely locked. If the platform is lowered all driving/steering operations are still possible but lifting/rotation are prevented. Remove the overload before using the machine again.
Fast flashing in case of fault in the control system of the platform load. With lifted platform the machine is completely blocked. After reading the manual instructions, trained staff can carry out an emergency manoeuvre for platform recovery.

CAUTION! The activation of this indicator is a synonym of danger since the load at platform is exceeding or no load control is active upon signalling.
For adjustment or activation in emergency situations read the MAINTENANCE chapter.

5.2 Ground control station and electric central unit.

The ground control station is to be used to:
- turn the machine ON/OFF;
- select the control station (ground or platform);
- operate the platform in emergency cases;
- display some operating parameters (working hours; Diesel engine operational faults; battery charger operation; etc.).

The ground control station (or electric central unit) contains the main electronic boards necessary to operate the machine and to carry out safety checks.

⚠ Access to the electric central unit is allowed to specialized personnel only for maintenance and/or repair purposes. Access the electric central unit only after the machine has been disconnected from any 220V or 380V power sources.

5.2.1 Ground control station.

The ground control station is located on the rotating turret (see paragraph "Location of main components").
The ground control station corresponds with the electric central unit.

⚠ Use the ground controls only in emergency situations to allow the platform to be recovered.
IT IS FORBIDDEN to use the ground control station as a workstation when personnel is on the platform.

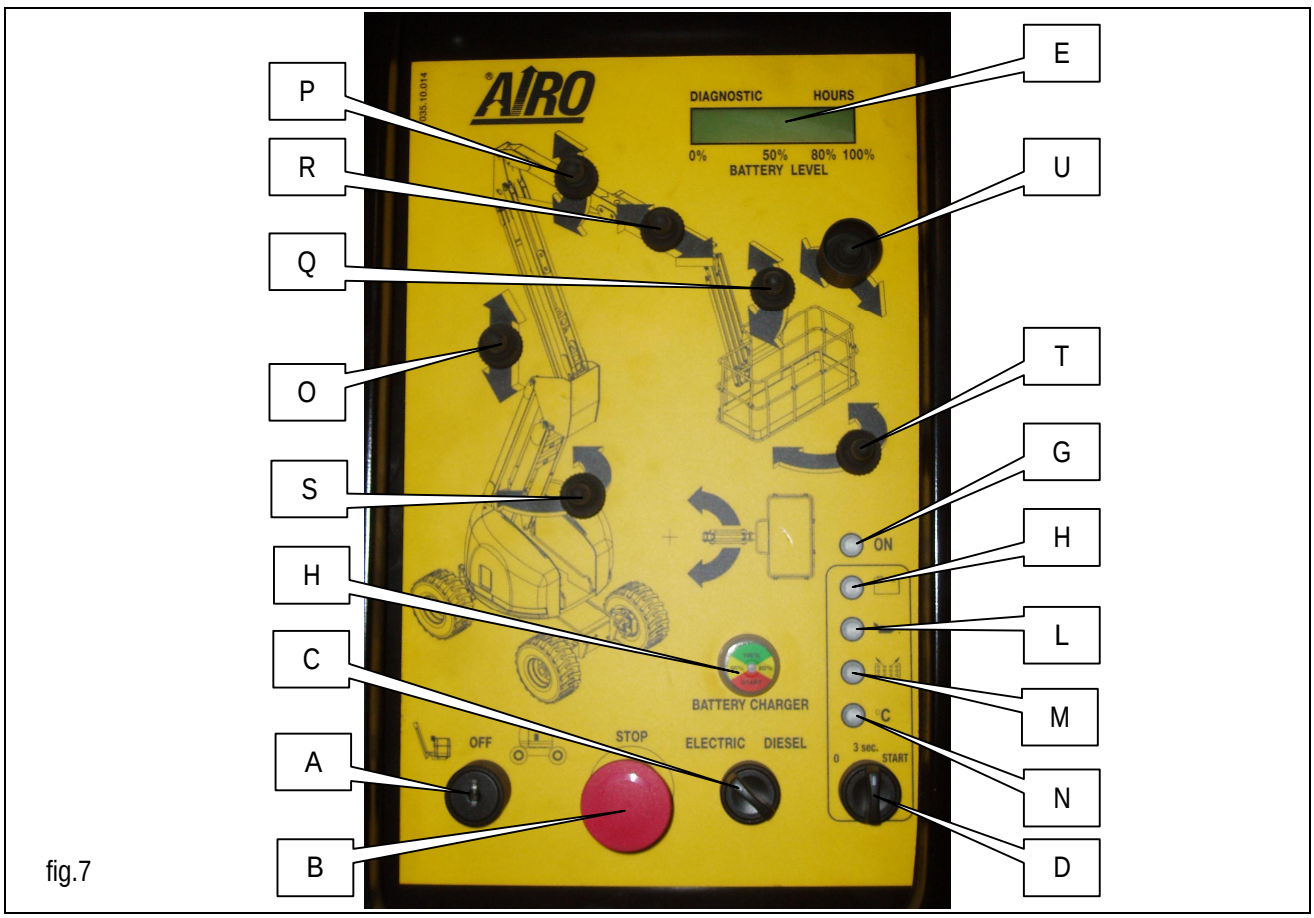


fig.7

A) ON-OFF key and control station selector (ground/platform)
B) Emergency stop button.
C) Selector for Diesel power for work or electric power.
D) Heat engine starting button (models “D” and “E/D”).
E) User interface display.
F) Battery charger warning light (models “E” and “E/D”).
G) Warning light: machine on.
H Alternator warning light (models “D” and “E/D”).
L) Oil warning light (models “D” and “E/D”).
M Air filter warning light (models “D” and “E/D”).
N) Motor head temperature warning light (models “D” and “E/D”).
O) SCISSORS LIFTING/LOWERING lever.
P) BOOM LIFTING/LOWERING lever.
Q) JIB LIFTING/LOWERING lever.
R) TELESCOPIC BOOM OUT/IN lever.
S) TURRET ROTATION lever.
T) PLATFORM ROTATION lever.
U) PLATFORM LEVEL compensation lever.

The key must be given only to authorized personnel. A duplicate key should be kept in a safe place.

5.2.1.1 On-off key and control station selector.

The on-off key located on the ground control station is used to:
- turn ON the machine by selecting one of the two control stations:
  - platform controls enabled with key switch set to platform symbol. Stable key position with possibility to extract the key;
  - ground controls enabled (for emergency operations) with key switch set to turret symbol. Position while action is being carried out. When the key is released the machine is turned off;
- turn OFF the control circuits by turning it to OFF.
- turn ON the battery charger by turning it to OFF (models “E” and “E/D”).

5.2.1.2 Emergency stop button.

By pressing this button the machine (as well as the heat engine on models “D”, “E/D” and “E/B”) is completely stopped; by rotating it of 1/4 turn (clockwise) the machine can be turned ON by means of the ON-OFF key (see chapter 5.2.1.1).

5.2.1.3 Selector for Diesel power for work or electric power (OPTIONAL).

Holding the ON-OFF key in position “ground controls” it is possible to select the type of power for the ground controls:
- If ELECTRIC is selected and the ON-OFF key is kept active in position “ground controls” the 12V electric pump is started for the emergency controls or the 48V electric pump for “E/D” models;
- If DIESEL is selected and the ON-OFF key is kept active in position “ground controls” the Diesel engine can be started.

5.2.1.4 Heat engine starting switch.

Holding the ON-OFF key in position “ground controls” after selecting the DIESEL power, the diesel engine can be started by means of the relevant switch.
In “0” position the Diesel engine is off;
In “3 sec” position the plugs pre-heating takes place (only for engines with plugs);
In “Start” position the engine starts.

5.2.1.5 User interface display.

The multifunction display for machine/user interface is used to:
- Display the operation parameters of the machine during normal functioning or in the event of a fault;
- Working hours of Diesel engine (when Diesel power is selected the working hours are displayed in the format HOURS:MINUTES and final letter D);
- Working hours of the emergency electric pump with continuous current (when 12V electrical power is selected the working hours are displayed in the format HOURS:MINUTES and final letter M) –OPTIONAL-;
- Working hours of the single-phase or three-phase work pump (when 220V or 380V electric power is selected –at platform- the working hours are displayed in the format HOURS:MINUTES and final letter E) –OPTIONAL-;
- Charge level of the battery (only electrical models E).

The user interface display is also used during any interventions by specialized personnel to calibrate/adjust the working parameters of the machine. This function is not available to the user.

5.2.1.6 Battery charger light.

Electric power and bi-fuel models (“E”, “E/D” and “E/B”), equipped with a built-in high frequency battery charger, are provided with this warning light indicating the operation of the battery charger (for more detailed information read the paragraph: “Battery charge”).

5.2.1.7 Warning light: machine on.

The green light is on with machine on with ground controls only.

5.2.1.8 Diesel engine warning lights.

These warning lights warn the user of any Diesel engine operational faults (models “D” and “E/D”). One of these warning lights turns ON when the engine is stopped. A “fault” message is sent to the operator on the platform (see paragraph “Platform control panel”).
Once the Diesel engine has stopped due to a problem signalled by one of these warning lights, the engine can no longer be re-started until such problem has been solved.

5.2.1.9 Platform control levers.

The various levers shown in the figure allow the platform to be operated. According to the various signs the corresponding movements are activated. These controls can be operated only if the on-off key is set to ON downwards (ground control station selected). We shall also remind you that the ground controls are to be used to operate the platform only in emergency situations and must not be used for any other purposes.

⚠ Use the ground controls only in emergency situations to allow the platform to be recovered.
IT IS FORBIDDEN to use the ground control station as a workstation when personnel is on the platform.

5.3 Platform access.

⚠ To get on the platform use only the access equipment the platform is provided with.

To get on the platform, lift the bar and get on board. Check that, once you are on the platform, the bar falls down closing the access.

⚠ Do NOT block the closing bar so as to keep the platform access door open.

With the ground controls (see paragraph “Ground control station.”) it is possible, operating the boom, to lower the height of access to the platform for a better access to the platform itself.

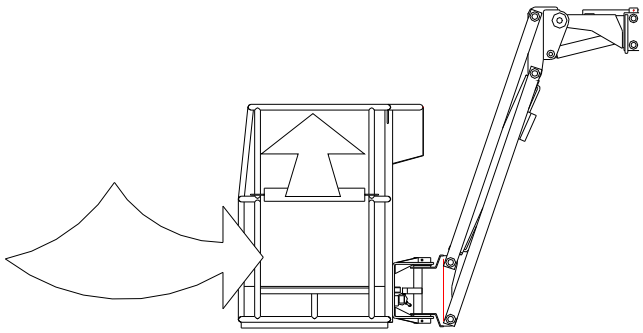


fig.10

5.4 Start-up.

To start the machine the operator shall:

- release the stop button located on the ground control station by rotating it by 1/4 turn clockwise;
- turn the on-off key on the ground control station to "Platform" position;
- remove the starting key and keep it in a safe place or hand it over to a person in charge on ground, properly informed of the use of the emergency controls;
- get onto the platform;
- release the stop button on the platform control panel by rotating it by 1/4 clockwise (see previous paragraphs).

For electric propulsion machines (models “E”), at this point the various functions can be performed by thoroughly following the instructions given in the previous paragraphs.

On dual propulsion models (Electric/Diesel) (models “E/D” or “E/B”), it is necessary to select the power supply type by means of the selector. To use the electric propulsion once this option has been selected the operator can start

performing the various functions by following the instructions given in the previous paragraphs. To use the thermic propulsion read the next paragraphs to start the heat engine.

For Diesel propulsion machines (models "D"):
- to use Diesel power select the power type "Diesel" with the selector and then read the next paragraphs to start the heat engine;
- to use the 220V or 380V electric power select the power type "Electric" with the selector and then (if available) the 220V or "380V" voltage (read the next paragraphs to start the three-phase electric engine);
- to use the 12V electric power (only for emergency controls) select the power type "Electric" with the selector and then (if available) the "12V" voltage and read the next paragraphs to start the 12V electric engine;

5.4.1 Diesel engine start-up.

By turning the starting key on the platform control panel:
- to "0" position the Diesel engine stops (models "D" and "E/D");
- to "3 sec" position the plugs pre-heating takes place (only engines with plugs) (models "D" and "E/D");
- In "Start" position the engine starts.

Do not insist on the starting position for longer than 3 seconds. In the event of failed start, check the fuel level by means of the relevant indicator and read the use and maintenance manual of the engine.
Do not try to start the engine if it is already running. This operation may cause the pinion of the starter to break (under normal conditions the control system blocks this operation).
In the event of operational faults, check the engine warning lights and read the Use and Maintenance manual of the engine.
NOTE: The Diesel engine can be started only if the dead-man pedal is neither pressed nor enabled. This means that the engine can be started only if the platform green warning light ON is flashing.

5.4.2 Starting the 220V electric pump (OPTIONAL).

Diesel power models can be equipped, on request, with a 220V pump for those operations of the booms (lifting, lowering, rotation).

To start the electric pump:

1) Insert the 220 V plug of the power cable into the socket (A);
2) Set the switch (B) shown in figure to ON position;
3) To start the electric pump with the platform controls:

- select the on-platform control post by means of the key-switch located on the electric switchboard on the chassis.
- Unlock the push-button (R) turning it of a ¼ of turn clockwise;
- Set the power selector (M) at platform to "Electric" position;
- Push the (O) button;
- operate the machine.
- Push the (O) button again to stop the machine.

N.B. when the machine is powered with 220V electric pump only platform positioning and not drive can be performed. The operations carried out with 220V electric pump are slightly slower than those with diesel engine.

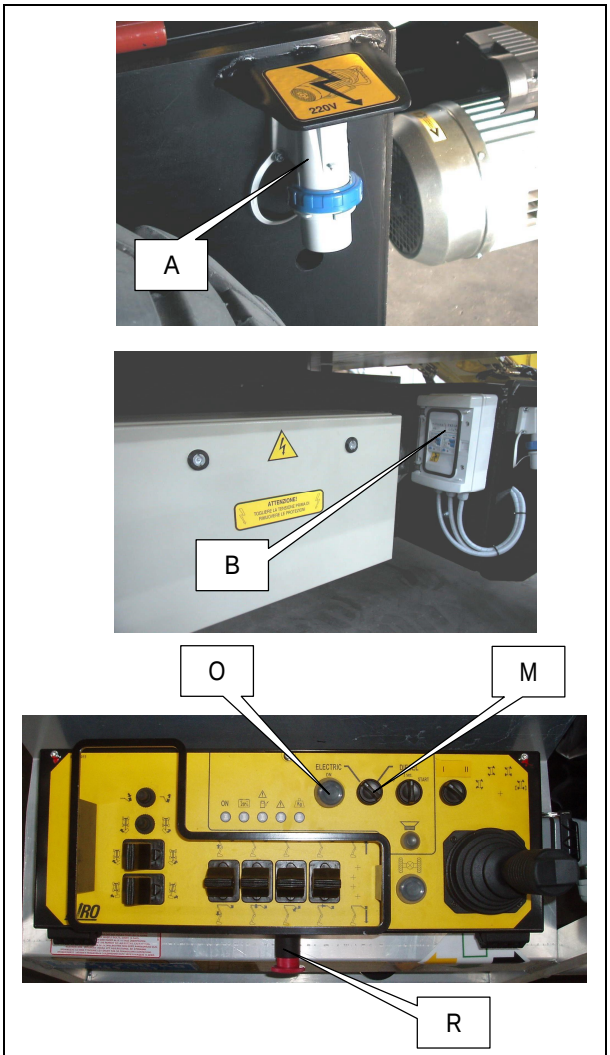


fig.11

⚠ WARNING!! Always check the position of the power cable during the movements.
Disconnect all electric power supplies before opening the cases.

5.4.3 Start-up of 380V work electric pump (OPTIONAL).

Diesel power models can be equipped, on request, with a 380V three-phase pump for those operations of the booms (lifting, lowering, rotation).

To start the three-phase electric pump:

1) Insert the 380 V plug of the power cable into socket (A) on the chassis;
2) Set the switches (C) shown in figure to ON position;
3) Set the angular red switch (F) to ON position turning it downwards or upwards. If the connection has been successfully carried out it is possible to start the electric pump as indicated in next paragraphs. On the contrary, in the event of a phase fault in the electric power the acoustic alarm is automatically enabled, and the electric pump cannot be started. In this case it is possible to compensate the power phases by turning the angular red switch (F) on the electric case by 90°.
4) To start the electric pump with the platform controls:

- Select the platform control station with the key switch on the ground control unit;
- Unlock the push-button (R) turning by a ¼ of turn clockwise;
- Set the power selector (M) to "Electric" position;
- Press the green button (O);
- Wait 5 seconds before moving the machine.

5) To stop the electric pump press button (O) again.

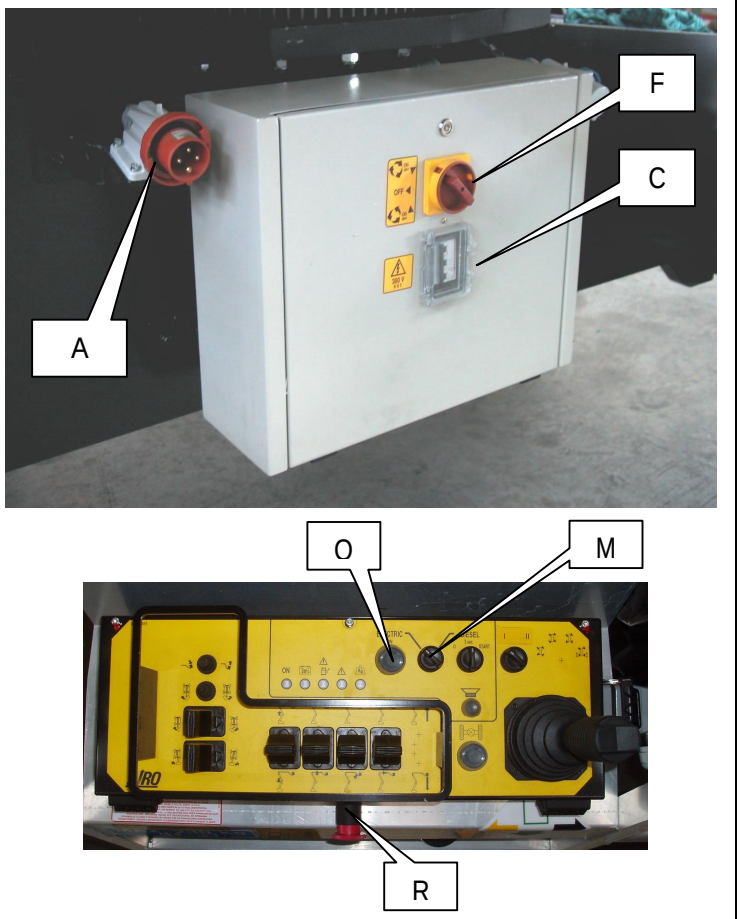


fig.12

NOTE: The electric pump can be started only if the dead-man pedal is neither pressed nor enabled. This means that the electric pump can be started only if the platform green warning light ON is flashing.

WARNING!! Disconnect all electric power supplies before opening the cases.
The platform with 380V three-phase power can be operated only from the platform.

N.B. when the machine is powered with 380V electric pump only platform positioning and not drive/steering can be performed. Moreover, remember that operations carried out with 380V electric pump are slightly slower than those with diesel engine.

5.5 Machine stop.

5.5.1 Normal stop.

In normal operating conditions:
- By releasing the controls the operation is stopped. Stop occurs within a time limit set in the factory, which guarantees smooth braking.
- By releasing the dead-man pedal located on the platform, the operation is immediately stopped. In the event of an immediate stop, braking is sudden.

5.5.2 Emergency stop.

Should it be necessary, the operator may immediately stop all machine functions from both platform and ground control station.
From the platform control station:
- By pressing the push-button on the control panel the machine is stopped.
- By releasing the dead-man pedal, the operation is immediately stopped. Due to the immediate stop, braking is sudden.

From the ground control station:
- By pressing the stop button on the ground control station (if available) the machine (all models) and the heat engine (models “D”, “E/D”; “E/B”) are stopped.
- By pressing the power stop button (if available – “E” models), thus cutting out machine power (power circuit cut-out).

To resume the operations:

From the platform control station:
- Turn the stop button of 1/4 turn clockwise;

From the ground control station:
- Turn the stop button (if available) of 1/4 turn clockwise;
- Pull the power circuit push-button (if available) to the outside until it locks in position to power the unit again.

5.5.3 Diesel engine stop.

In order to stop the Diesel engine:

1) From the platform control station:
- Turn the starting key anticlockwise to position “0”.
- Otherwise, press the push-button.

2) From the ground control station:
- Turn the starting key anticlockwise to position “0”.
- Otherwise, press the push-button.

Do not stop the engine when the r.p.m. is high. Before stopping the engine wait until the r.p.m. is at the lowest.

5.6 Emergency manual controls.

This function is to be used only in emergency situations when no motive power is available.

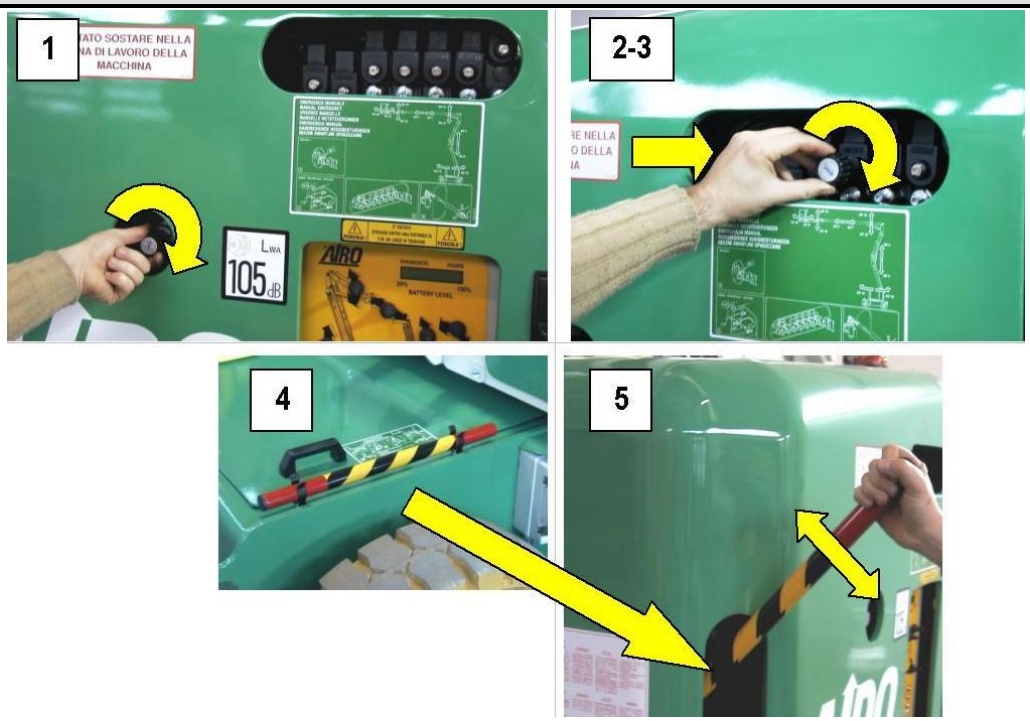


fig.13

In case of fault in the electric or hydraulic system, carry out the following emergency procedures:

1) Screw the indicated tap completely (solenoid valve EV1);
2) Insert and screw the emergency actuator on the solenoid valve corresponding to the desired movement (see below correspondence between solenoid valves names and obtained movements);
3) Completely screw the knurled knob of the previously positioned actuator;
4) Remove the operating lever of the manual pump and insert it on the pump itself;
5) Activate the emergency pump;
6) Check the correct execution of this procedure.

NB: In case of machines with simultaneous movements (OPTIONAL) the procedures for platform recovery are the same but the operations are to be carried out from point 2.

Electric valves and relevant movements:

EV5= Scissors lowering
EV6= Telescopic boom extraction
EV7= Telescopic boom retraction
EV12= Turret right rotation
EV13= Turret left rotation
EV15= Boom lowering
EV18= Jib lifting
EV19= Lowering
EV21= Platform right rotation
EV22= Platform left rotation

WARNING: THE EMERGENCY CONTROL CAN BE INTERRUPTED AT ANY MOMENT BY RELEASING THE KNOB OR BY STOPPING THE PUMP.

Once this emergency manoeuvre has been carried out, the knurled knobs and the tap must be set to their initial position again in order to resume the operations (in normal position the knobs are completely unscrewed).

5.7 Socket for electric tool connection and battery charger powering.

The platform is equipped with a socket (220-230V AC) enabling the operator to connect the electric tools necessary to carry out his operations and to power the battery charger.
To activate the electric line (see picture aside) introduce a cable into the socket (220-230V Ac. 50 Hz) and set the earth-leakage circuit breaker switch, close to the socket, to ON position. It is advisable to check the earth-leakage circuit breaker by means of the specially provided TEST button.

The plugs and sockets equipped on standard machines comply with EEC standards and can therefore be used in EU member countries.
On request the machine can be equipped with plugs and sockets in compliance with local standards or with particular needs.

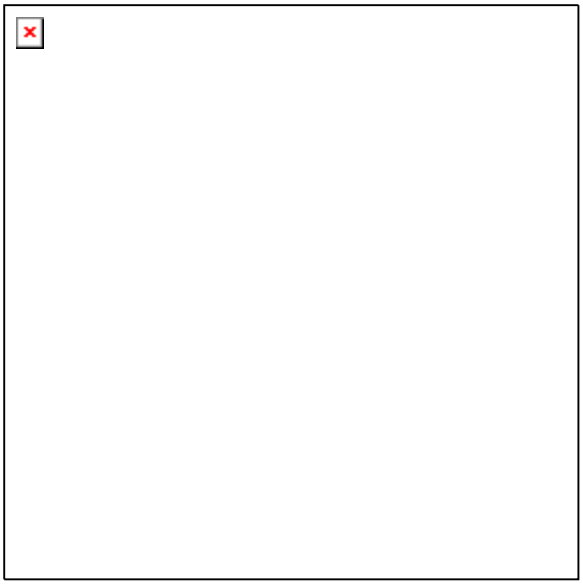


fig.14

5.8 End of work.

After stopping the machine according to the instructions given in the previous paragraphs, you are advised to:
- Always set the machine to rest position.
- Press the Stop button on the ground control station.
- Remove the keys from the control panel to prevent unauthorized people from using the machine.
- Recharge the battery according to the instructions given in section "Maintenance" (models “E” and “E/D” only).

6 HANDLING AND CARRYING.

6.1 Handling.

Before using the machine, make sure that the mechanical lock device of the turret is disabled (see figure aside).

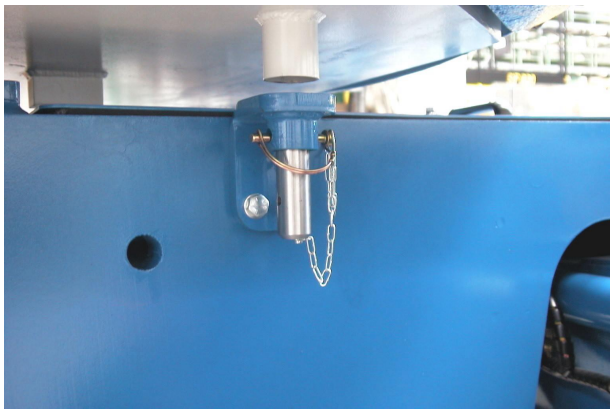


fig.15

To handle the machine in normal operating conditions follow the instructions given in chapter "GENERAL USE INSTRUCTIONS" under paragraph "Drive and steering".

When the platform is completely lowered (or within a given height according to specific needs and further to checks) the machine can be handled (i.e. drive can be performed) at different speeds to be freely selected by the user.

When the platform is lifted and exceeds a given height, the enabled machines (see chapter “Technical Features) can be driven at a reduced speed (automatically) up to the height specified in chapter “Technical Features”.

⚠ CAUTION! Drive with lifted platform may be subject to different restrictions according to the country where the machine is used. Find out about the legislative limits concerning this manoeuvre from the bodies of Health and Safety at work.

It is absolutely forbidden to drive the unit when the platform is lifted unless the ground is horizontal, flat and steady.

Check that there are no holes or steps on the floor and bear in mind machine overall dimensions.

Before any movement, verify the presence of people in close proximity to the machine and, in any case, proceed with the utmost caution.

Before any movement make sure that the machine plugs are disconnected from the power source.

Before steering and driving the unit, check the actual position of the rotating turret (see the relevant stickers on the chassis) so as to achieve the correct movement direction.

While de-placing the unit with lifted platform do not load horizontal loads onto the platform (the operators on board must not pull ropes, wires, etc.).

6.2 Carrying.

In order to carry the machine to the various working sites, follow the instructions given below.
Considering the large dimensions of some models, before carrying, it is recommended to inquire about the overall dimension limits for road transport in force in your country.

Before carrying the machine, turn it off and remove the key from the control panel. No people are allowed in proximity to or on the machine to avoid any risks deriving from sudden movements.
For safety reasons never lift or tow the machine by means of its booms or platform.
Loading operations are to be carried out on a flat surface with a suitable capacity, after setting the platform to rest position.

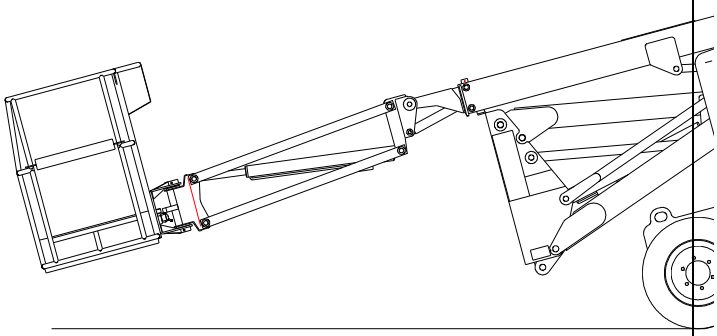
To carry the machine the operator shall load it onto a vehicle either:

1) By means of loading ramps and translation controls located on the platform to load it directly onto the vehicle- if ramp slope is within the gradeability described in paragraph "TECHNICAL FEATURES" and capacity is adequate to weight- according to the instructions given in paragraph "GENERAL USE INSTRUCTION" under paragraph "Drive and steering" for correct operation of drive controls. During the loading operation following this system, it is advisable to lift the jib (if present- see picture aside) to prevent the machine from hitting the ground. Pay attention not to load other booms during this operation to prevent the emergency microswitches from being activated, which in case of inclined machine disable all the manoeuvres except the lowering ones. If the slope exceeds the gradeability, the machine is to be towed by means of a windlass only if the operator on the platform simultaneously activates the drive control to release the parking brakes.

2) By means of hooks and steel ropes (with safety factor = 5, see machine weight in Technical features) connected to the provided holes as indicated in the picture aside.

3) By means of a lift truck of a suitable capacity (see machine weight in table "Technical features" at the beginning of this manual) equipped with forks having at least the same length as the machine width. Insert the forks as indicated by the stickers on the machine. Should these stickers be not available, DO NOT lift the machine by means of a lift truck. Lifting the unit by means of a lift truck is a dangerous operation, which must be carried out by qualified operators only.

1)



2)

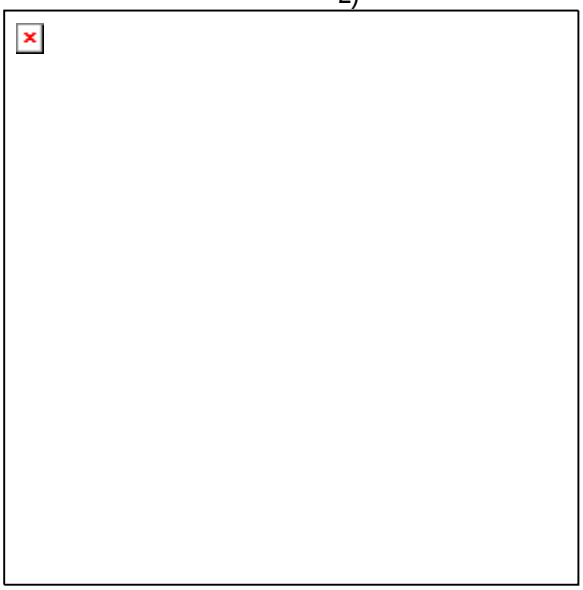


Fig.16

After placing the machine onto the carrying vehicle, fasten it by means of the same holes used for lifting.

Lock the turret with the mechanical blocking safety device as specified in figure 14.

To avoid breaking the platform overload controller, thus causing the machine to stop, DO NOT fix the machine to the vehicle base by tying the platform (any model) or the last lifting boom.

Before carrying the unit check the stability grade.

Do not use the machine to tow other vehicles.

6.3 Emergency towing.

In the event of a fault, carry out the following operations to tow the machine:

1) Hook the machine to the provided holes;
2) Unscrew the two bolts at the centre of the drive reduction gears by means of a 10 mm wrench for hexagonal head (the 2 wheel drive machines have 2 drive reduction gears; the 4 wheel drive machines have 4 drive reduction gears) and slide the cover of the reduction gears along the slots; then, remove the pin at the centre of the drive reduction gears;
3) Reposition the pin into the seats of the reduction gears in reverse order; place the cover again and tighten the bolts;
4) Tow at a very slow speed (remember that when the machine is being towed, brakes are out of order). For SG....-J-E SG....-J-E/D it is necessary to lift the front part during the towing operation.

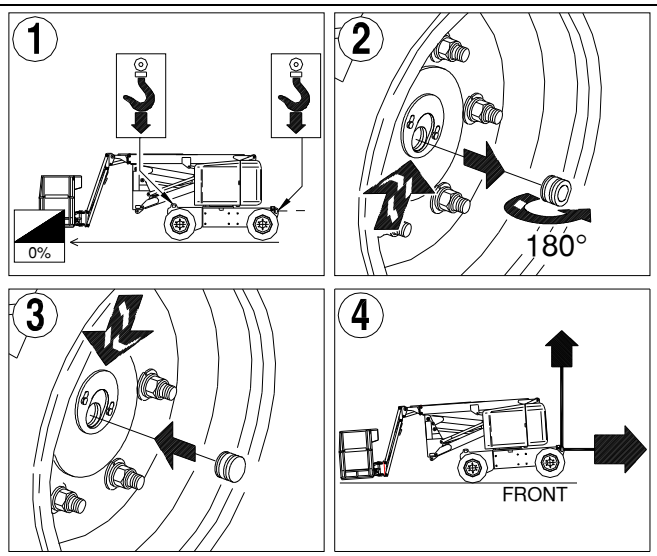


Fig.17

CAUTION! THIS OPERATION MAY CAUSE OIL LEAKAGE FROM THE DRIVE REDUCTION GEARS.

To resume the normal operation, set back the machine to initial conditions and, if necessary, top up the oil level inside the drive reduction gears.

Tow at a very slow speed (remember that when the machine is being towed, brakes are out of order). Tow only on a flat ground.

7 MAINTENANCE.

Always carry out maintenance operations when the machine is still, after having removed the key from the control panel, and with the platform in rest position.
Carry out only the maintenance and adjustment operations described in this user manual. In emergency situations (e.g. breakdown, tyres replacement) contact Our Technical Support.
Repairs and maintenance operations are to be carried out by trained personnel only.
During interventions, check that the machine is completely blocked. Before carrying out maintenance operations inside the lifting equipment, check that this is off-line in order to avoid accidental lowering of the booms.
Remove the battery cables and provide batteries with a suitable protection during welding operations.
Carry out maintenance operations on the heat engine only when it is not running and sufficiently cool (except for those operations, such as oil change, which must be performed when the engine is hot). Risk of burns in contact with hot parts.
Do not use petrol or other flammable materials to clean the heat engine.
For maintenance operations on the heat engine, read the manufacturer's manual of the heat engine supplied on machine purchase.
In case of replacement, use original spare parts only.
Disconnect the 220V AC and/or 380V AC sockets, if any.

CAUTION! NEVER MODIFY OR TAMPER WITH MACHINE PARTS TO IMPROVE THE MACHINE PERFORMANCE AS THIS MAY AFFECT ITS SAFE OPERATION.

7.1 Machine cleaning.

To clean the machine use non-pressurized water jets after properly protecting the following parts:
- the control stations (both platform and ground);
- the electric central unit and all electric boxes in general;
- the electric motors.

Do not use pressurized water jets (high-pressure cleaners) to clean the machine.

After washing the machine, always:
- dry the machine;
- check integrity of plates and stickers;
- lubricate the articulated joints equipped with greaser.

7.2 General maintenance.

The table below indicates the main maintenance operations and their frequency. The machine is equipped with a service hour-meter.

Operation	Frequency
Screw tightening as indicated in paragraph "Various adjustments"	After the first 10 working hours
Oil level check in hydraulic tank	After the first 10 working hours
Drive reduction gear oil change	After the first 100 working hours
Battery state (charge and liquid level)	Every day
Deformation of tubes and cables	Every week
Heat engine fixing on elastic supports	Every month
Oil level check in hydraulic tank	Every month
Articulated joints and sliding blocks greasing	Every month
Stickers and code plates	Every month
Operation check of dead-man pedal safety system	Every six months
Air purging from oscillating axe cylinders	Every year
Screw tightening as indicated in paragraph "Various adjustments"	Every year
Periodic operation check and structure visual check	Every year
Operation check and adjustment of the turret inclinometer	Every year
Operation check and adjustment of platform overload controller	Every year
Operation check of Microswitches M1	Every year
Brake system operation check	Every year
Suction / discharge filter cleaning	Every two years
Drive reduction gear oil change	Every two years
Total oil change in hydraulic tank	Every two years

DIESEL (D) AND ELECTRIC-DIESEL (E/D) MODELS. As it is possible to install different types of Diesel engines, refer to the instructions manual of the engine manufacturer for all maintenance operations.

7.2.1 Various adjustments.

Check the conditions of the following components and, if necessary, tighten:

1) Wheel screws;
2) Traction motor fixing screws;
3) Steering cylinder fixing screws;
4) Fixing screws of steering hub pins;
5) Basket fixing screws;
6) Hydraulic fittings;
7) Safety dowels of boom pins;
8) Rotation reduction gear fixing screws;
9) Elastic supports of heat engine.

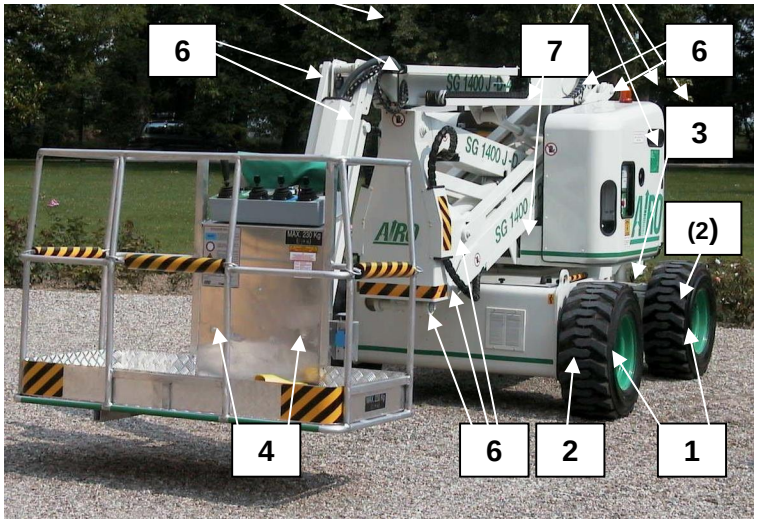


Fig.18

SCREW TIGHTENING TORQUE (metric screw thread, standard pitch)						
Class	**8.8 (8G)**		**10.9 (10K)**		**12.9 (12K)**	
Diameter	kgm	Nm	kgm	Nm	kgm	Nm
M4	0.28	2.8	0.39	3.9	0.49	4.9
M5	0.55	5.5	0.78	7.8	0.93	9.3
M6	0.96	9.6	1.30	13.0	1.60	16.0
M8	2.30	23.0	3.30	33.0	3.90	39.0
M10	4.60	46.0	6.50	65.0	7.80	78.0
M12	8.0	80.0	11.0	110	14.0	140
M14	13.0	130	18.0	180	22.0	220
M16	19.0	190	27.0	270	33.0	330
M18	27.0	270	38.0	380	45.0	450
M20	38.0	380	53.0	530	64.0	640
M22	51.0	510	72.0	720	86.0	860
M24	65.0	650	92.0	920	110	1100

7.2.2 Greasing.

Grease all articulated joints at least every month.
Moreover, remember to grease the articulated joints in the following cases:

- after washing the machine;
- before using the machine again after a long time-interval;
- after using the machine in adverse environmental conditions (high humidity levels; presence of dust; coastal areas, etc).

Grease all points indicated in the picture aside (and all articulated joints equipped with greaser) with grease type:

ESSO BEACON-EP2

or similar.

Fig.19

7.2.3 Hydraulic circuit oil level check and change.

Check the level periodically by means of the provided cap (detail A in the picture aside) equipped with a dipstick; always make sure that the level lies between the max. and min. values; if necessary, top up until the max. level is reached.

To empty the oil tank, place a container under cap B (under the turret) and unscrew it.

The oil tank capacity, which varies according to the models, is indicated in the table at page 46.

Do not dispose of used oil in the environment. Comply with the current local standards.

Use only the types of oil indicated in the table at page 51.

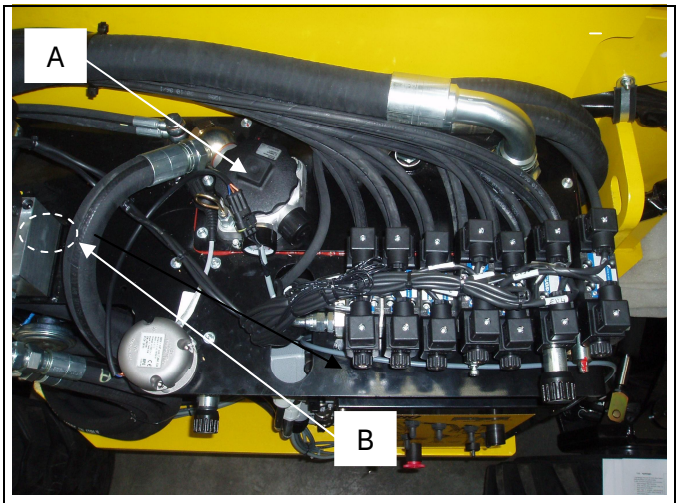


Fig.20

7.2.4 Hydraulic filter cleaning / replacing.

7.2.4.1 Suction filters.

All models are equipped with a suction filter installed inside the tank at the base of the suction tube, which has to be cleaned (or replaced) at least every two years.

To replace the suction filters installed inside the tank (see figure):

1) Stop the machine by pressing the push-button of the ground central unit;
2) Empty the hydraulic tank;
3) Unscrew the tank cover with the metal suction tubes;
4) Extract the cover from the tank;
5) Unscrew the filter from the suction tube and clean it with a detergent and a compressed air jet by blowing from the connection or replace the filtering element;
6) To restore the initial condition, carry out the above-mentioned operation in reverse order.

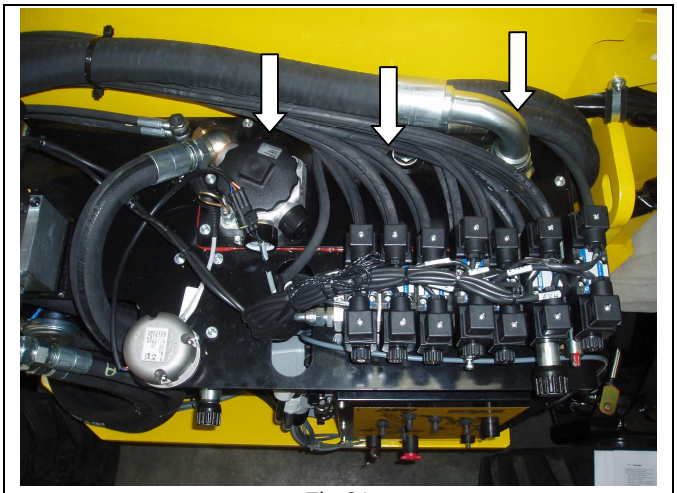


Fig.21

During these operations a quantity of oil may leak out. In this case remove the oil by means of cloths or let the oil flow by placing a suitable container under it.

7.2.4.2 Return filter.

The return filter is directly flanged to the tank cover.
The return filter is equipped with a clogging indicator to indicate when the filtering cartridge is to be cleaned or replaced.
During normal operation, the visual indicator is in the green zone. When the indicator is in the red zone, the filtering cartridge is to be replaced. To replace the filtering cartridge:

- Stop the machine by pressing the push-button on the ground central unit;
- Remove the filter cover;
- Remove the cartridge;
- Fit the new cartridge paying attention to the correct position of the retaining spring and place the cover again.

fig.22

During these operations a quantity of oil may leak out. In this case remove the oil by means of cloths or let the oil flow by placing a suitable container under it.

⚠ IT IS FORBIDDEN to start the machine when the filter cover is missing or not properly tightened.

Replace the filters using only original accessories available at our Technical Support.
Do not re-use used oil and do not leave it in the environment, but dispose of in compliance with local standards in force.
Once the filters have been replaced (or cleaned), check the hydraulic oil level in the tank.

7.2.5 Traction reduction gear oil level check and change.

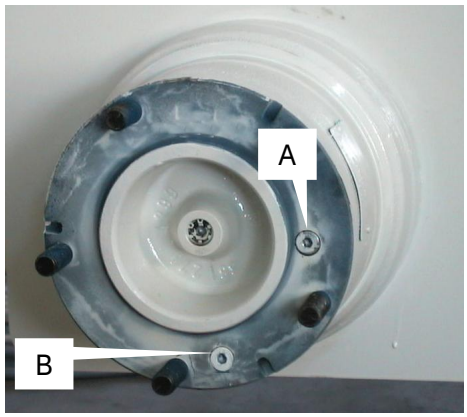


fig.24

The oil level should be checked every two years. Place the machine so as to have the two caps (A and B) in the position shown in the picture aside (in a few cases it is necessary to remove the driving wheels to access the a.m. caps). Check the level by means of cap (A). Oil check must be carried out when the oil is hot. The level is correct when the reduction gear body is full of oil up to the cap limit (A). Should a lubricant volume higher than 10% be topped up, check that there is no oil leakage in the system. Do not mix different types of oil, of the same or of different brands. Do not mix mineral oils and synthetic oils. The oil must be changed the first time after 50-100 working hours, and afterwards after every 2500 working hours or at least every two years. Depending on the actual operating conditions, these intervals may be varied for each single case. While changing the oil it is advisable to wash the internal part of the crankcase with a fluid recommended by the lubricant producer. To avoid sludge deposits, the oil must be changed when the reduction gear is hot. To change the oil unscrew cap B, and place a container of a 2-litre capacity under it. Empty the reduction gear body completely, clean it as described above and then fill it up to the limit level of cap A through the same hole (for max. capacity see following table).

HYDRAULIK SYSTEM OIL		
MARCA	TIPO	REQUIRED QUANTITY SG1400-J-4WD SG1400-J-E/D SG1400-J-E SG1600-J-4WD SG1600-J-E/D SG1600-J-E
ESSO	Invarol EP46	105 liters
AGIP	Arnica 45	
ELF	Hydrelf DS46	
SHELL	Tellus SX46	
BP	Energol SHF46	
TEXACO	Rando NDZ46	

LUBRICATING OIL FOR REDUCTION GEARS		
MARCA	TIPO	QUANTITA'
ESSO	Compressor Oil LG 150	0.5 liters x motor
AGIP	Blasia S 220	
CASTROL	Alpha SN 6	
IP	Telesia Oil 150	

7.2.6 Air purging from oscillating axle locking cylinders.

Once drive has been stopped and with raised platform, the axle locking cylinders are locked in position thus increasing the machine stability.
Check that no air is present inside the oscillating axle cylinders every year.
To carry out this check it is necessary to:

- Remove the protection cylinder crankcase (A) of the oscillating axle.
- Unscrew the plug (B) of one of the two cylinders of the oscillating axle.
- Carry out the drive operation by bringing the two oscillating axle cylinders to stroke position several times, until there is only oil leaking out of the plug of the locking valve.
- Once purging has been completed, screw cap (B) and check the oil level in the tank.

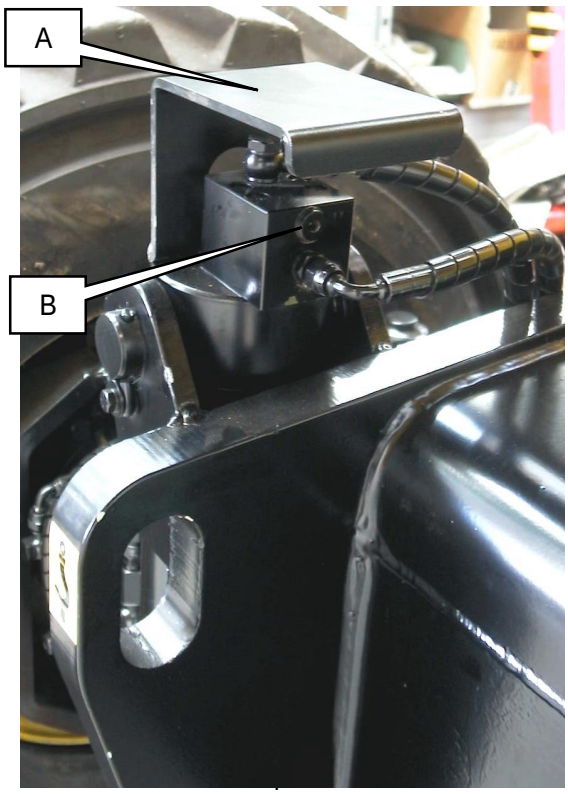


Fig.25

⚠ Attention! This operation ought to be carried out simultaneously by two operators: one is to drive the unit, the other is to check the operation and collect the leaking oil.
This operation ought to be carried out in rooms that allow the oil leaking from the cylinders to be recovered.

CALL THE TECHNICAL SUPPORT

7.2.7 Telescopic boom sliding blocks clearance adjustment.

Check the wear of the telescopic boom sliding blocks every year.
The correct clearance between the blocks of the boom is 0,5-1 mm; in case of higher clearance tighten the sliding blocks as follows:

- Unscrew the dowel A;
- Screw the sliding block B with a seeger wrench until the above mentioned clearance is reached.

AS THIS OPERATION IS VERY IMPORTANT IT IS TO BE CARRIED OUT BY SPECIALIZED TECHNICIANS ONLY.

CALL THE TECHNICAL SUPPORT

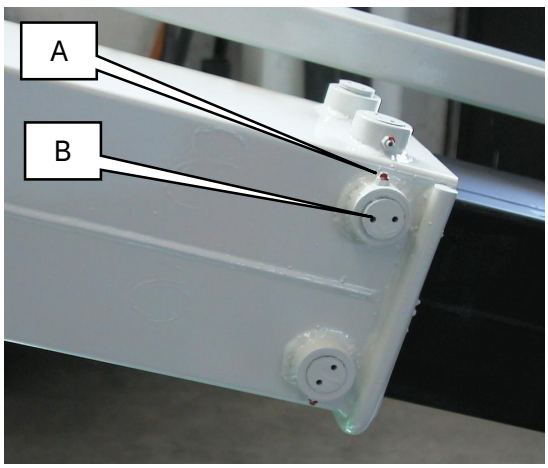


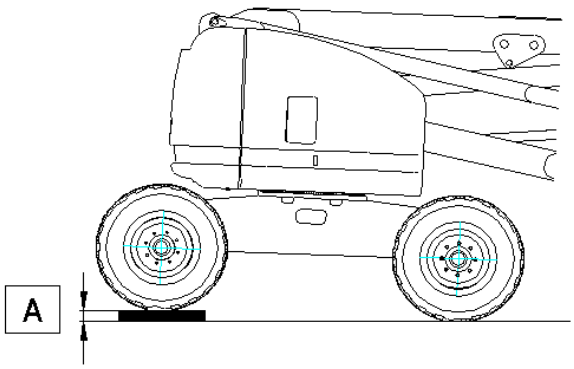
fig.27

7.2.8 Inclinometer adjustment.

The inclinometer (see figure aside) does not require any adjustment since it is calibrated in the factory before the machine is delivered.
This device controls the chassis inclination and when inclined over the allowed value:

- It disables lifting when the platform exceeds a given height (varying according to model);
- It disables drive when the platform exceeds a given height (varying according to model);
- It warns the operator of the instability condition by means of an audible warning device and a warning light located on the platform (see "General use instructions").

Adjustment is required only if the device is to be replaced.
The inclinometer checks the inclination with respect to the two axes (X; Y). On machine models with the same transversal and longitudinal inclination limits, the control is carried out with reference to one axis only (X-axis).



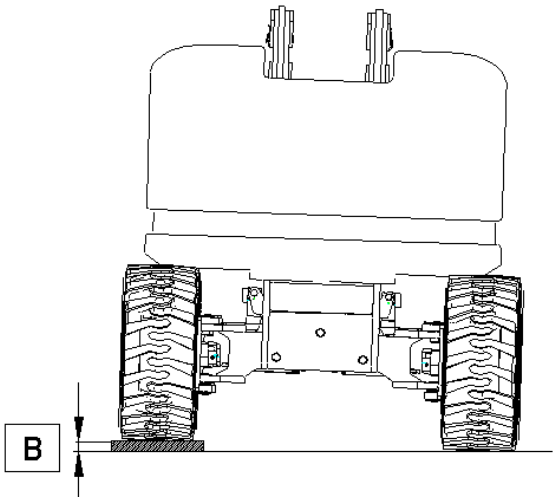


fig.29

<u>To check the inclinometer operation according to the longitudinal axis (generally X-axis):</u>

- Using the controls of the control panel set the machine so as to place a shim of dimension (A+10 mm) under the two rear or front wheels (see following table);
- Wait three seconds (intervention delay set at factory) until the danger red light and the audible platform device turn on;
- With platform lowered (booms down, and jib at a height between +10° and –70°) all manoeuvres are still possible;
- Lifting one of the booms and/or lifting the jib over 10° with respect to the horizontal axis, the machine control system locks the lifting and drive controls.

<u>To adjust the inclinometer according to the transversal axis (normally Y-axis):</u>

- Using the controls of the control panel set the machine so as to place a shim of dimension (B+10 mm) under the two side right or left wheels (see following table);
- Wait three seconds (intervention delay set at factory) until the danger red light and the audible platform device turn on;
- With platform lowered (booms down, and jib at a height between +10° and –70°) all manoeuvres are still possible;
- Lifting one of the booms and/or lifting the jib over 10° with respect to the horizontal axis, the machine control system locks the lifting and drive controls.

CAUTION! Usually the inclinometer does need to be adjusted. The equipment necessary for the replacement and adjustment of this component is such that these operations should be carried out by skilled personnel.

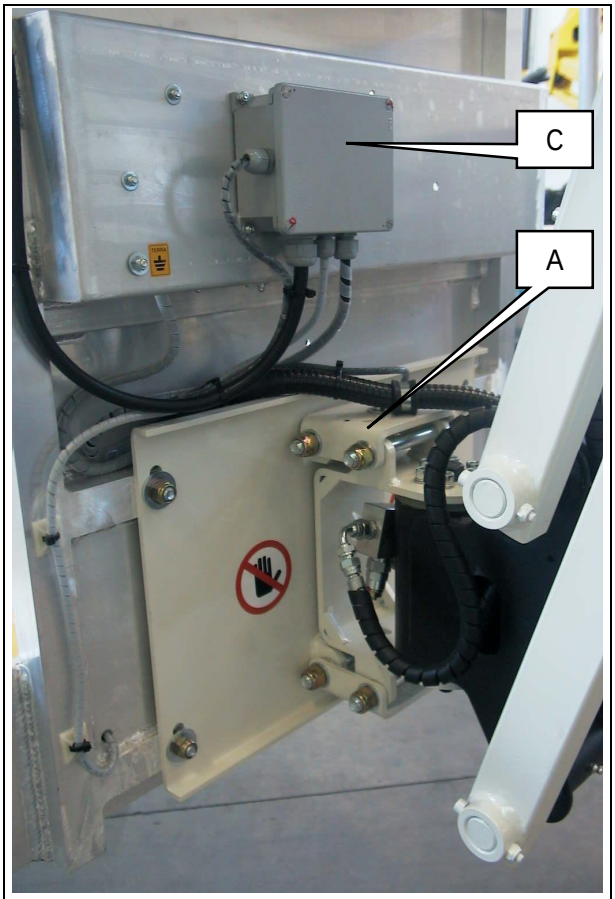
CALL THE TECHNICAL SUPPORT

MODELS		
SHIMS	SG1400-J-D-4WD	SG1400-J-E SG1400-J-E/D
A [mm]	135	100
B [mm]	135	95

CAUTION! The dimensions of shims A and B refer to max. allowed inclination as indicated in table “TECHNICAL FEATURES”. To be used during the inclinometer calibration.

7.2.9 Adjustment of the overload controller (load cell).

The AIRO self-propelled articulated boom aerial platforms are equipped with a sophisticated system controlling the platform overload.
Normally the overload controller does not require any adjustment, since it is calibrated in the factory before the machine is delivered.



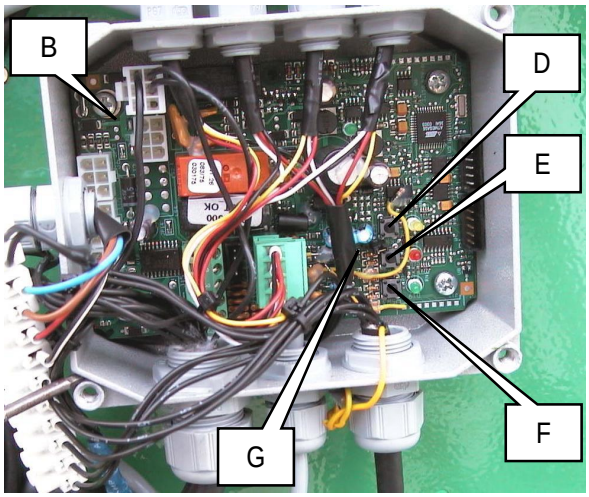


Fig. 30

This device checks the load on the platform and:

- It disables all movements if the platform is overloaded by 30%(*) compared to the rated load;
- It warns the user of the overload condition by means of the audible warning device and the platform warning light (see “General use instructions”);
- By removing the exceeding load, the machine can be operated again.

The overload controller consists of:

- Deformation transducer (A);
- Electronic board (B) to calibrate the device and by-pass in case of emergency, located inside a tight case (C) on the platform;

Device operation check:

- When the platform is completely lowered load a charge evenly distributed equal to the normal load allowed by the platform (see paragraph “Technical features”). In this condition all manoeuvres should be possible both from platform and ground control station;
- When the platform is completely lowered add to the rated load an overload of 30% of the rated load. In this condition the red light and the audible device turn on (see “General use rules”) but all manoeuvres are still possible;
- Lift one the booms until you activate one of the microswitches for boom control (remember that the jib activates its own microswitch when it exceeds a height of 10° with respect to the horizontal axis);
- The alarm condition stops the machine completely. To operate the machine again, remove the excessive load.

The calibration of the system is necessary:

- in case of replacement of one of the items composing the system;
- when, following an excessive overload or a collision, without the excessive load the danger condition is signalled anyway.

To calibrate the device:

- turn off the machine;
- open the box which contains electronic board C;
- with no load on the platform, introduce the jumper to connector G;
- turn on the machine;
- press button D (the yellow and red light turn on);
- press button E (the luminosity of the red light increases a few seconds), and the load system will be reset;
- on the furthermost part of the platform overhang place a load equal to the rated load plus 25%;press button F (the green light turns on a few seconds);
- press button D again to exit the calibration procedure (the yellow light turns off and if the procedure has been carried out correctly, the red light stays on signalling the overload);
- turn off the machine;
- open the jumper on connector G;
- turn on the machine;
- check that after removing the 25% overload (only the rated load stays on the platform) the alarm condition does not occur in any of the platform positions (platform down, up, driving, rotated);
- once the adjustment has been completed, close the box which contains the board.

In case of fault and impossibility to calibrate the device, a by-pass of the system is possible by means of key switch (H)under the control panel.
Rotate the key switch of a quart of a round e hold the position for at least 3 seconds.
WARNING!! IN THIS CONDITION THE MACHINE CAN CARRY OUT ANY OPERATION, THOUGH THE RED FLASHING LED AND THE INTERMITTENT AUDIBLE DEVICE SIGNAL THE DANGER CONDITION. TURNING OFF THE MACHINE WILL RESET THE SYSTEM, AND UPON STARTING THE LOAD DETECTING SYSTEM OPERATES AGAIN SIGNALLING THE PREVIOUS OVERLOAD CONDITION.
THIS OPERATION IS ALLOWED ONLY FOR EMERGENCY HANDLING OF THE UNIT. DO NOT USE THE MACHINE IF THE OVERLOAD CONTROLLER IS NOT EFFICIENT.

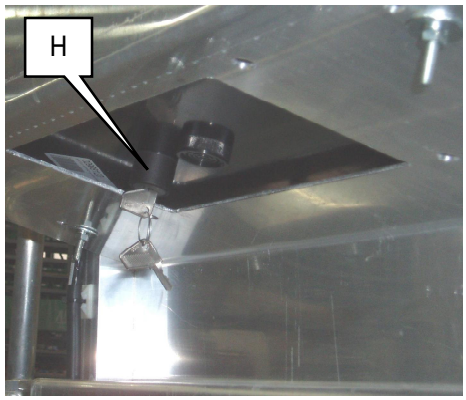


Fig.31

CAUTION!
Calibration is to be carried out by skilled personnel. This operation may not be performed by the operator.

7.2.10 Operation check of microswitches M1.

The lifting booms are controlled by microswitches:
- M1A on the scissors;
- M1B on the boom;
- M1C on the Jib;
- M1E on the telescopic extraction (OPTIONAL for SG1400-J – STANDARD for SG1600-J).

The functions of the microswitches M1A- M1B- M1E are the following:
with platform not in rest position (at least one of the microswitches M1A-M1B-M1E is activated):
- The safety drive speed is automatically activated;
- If the chassis is inclined over the max. allowed inclination, lifting and drive controls are inhibited;
- The compensation control for platform levelling is inhibited;
- When the platform is overloaded ALL operations are inhibited until removal of overload.

The following functions of the microswitch M1C on the Jib were designed to support loading/unloading from the ramps of a vehicle:
with booms in rest position (microswitches M1A-M1B-M1E not activated), and Jib with inclination higher than +10° according to the horizontal axis (M1C activated):
- The first drive speed is automatically activated;
- If the chassis is inclined over the max. allowed inclination, Jib lifting and drive controls remain allowed;

Once a year check the working conditions of the microswitches M1…. .

7.2.11 Operation check of dead-man pedal safety system.

The platform dead-man pedal is for enabling the operation controls of the machine from the platform control station.
If the control panel is selected but the dead-man pedal is not pressed the green light on the platform is flashing and the machine cannot be operated.
Pressing the dead-man pedal the operation controls of the machine are activated and the condition is signalled by a steady green led.
Once the pedal has been pressed, the controls are to be activated within 10 seconds, after which they are deactivated and the green light will flash again.

7.2.12 Starter battery models “D” “E/D”

The starter battery is for:
- Powering the control circuits of the machine;
- Starting the heat engine;
- Powering the 12V electric pump for emergency operations.

7.2.12.1 Starter battery maintenance.

The starter battery does not require any maintenance operation.
- Keep terminals clean by removing any oxidation residues.
- Check correct terminal tightening.

7.2.12.2 Starter battery recharge.

Starter batteries do not require any recharge.
During normal operation of the Diesel engine an alternator recharges the battery. On those machines equipped with a 380 three-phase electric pump, the electric pump control system keeps the starter battery charged.

CAUTION!
Check the charge of the starter battery after carrying a recovery operation of the platform with the 12V emergency electric pump (OPTIONAL).

7.2.13 "TRACTION" battery for models "E" and "E/D".

The battery is one of the most important elements of the machine. It is recommended to keep it in an efficient condition to increase its useful life, to avoid faults and to reduce the management costs of the machine.

7.2.13.1 General instructions for TRACTION battery.

• Charge the battery in airy rooms and open the caps to allow the outflow of gas.
• Do not approach the battery with open flames. Risk of explosion due to the formation of explosive gases.
• Do not carry out temporary or irregular electric connections.
• The terminals must be tightened and without deposits. The cables must be provided with a good insulation.
• Keep the battery cleaned, dry and free of oxidation products by using antistatic cloths.
• Do not place tools or any other metal object on the battery.
• Check that the electrolyte level is 5-7 mm higher than the splashguard level.
• During charging operations check that the electrolyte temperature is not higher than 45°C max.
• If the machine is equipped with an automatic topping up device, follow the instructions described in the battery user manual carefully.

7.2.13.2 TRACTION battery maintenance.

• For normal water operating conditions, water topping up is to be carried out every week.
• Top up using distilled or demineralised water.
• Top up after battery charging. The electrolyte level must be 5-7 mm higher than the splashguard level.
• For machines equipped with automatic topping up device, follow the instructions given in the battery user manual.
• Battery discharge must be stopped when 80% of the battery rated capacity has been used. An excessive and prolonged discharge irreversibly damages the battery.
• Battery charge is to be carried out according to the instructions given in the next paragraphs.
• Keep caps and connections covered and dry. A careful cleaning allows electric insulation protection, good operation and useful life of the battery.
• In case of faulty operations due to the battery, avoid any direct intervention and call the Technical Support.
• When the machine is not being used the batteries will run down automatically (automatic decharge). To avoid the battery operation from being compromised it is necessary to charge it at least once a month. This has to be done even if the density values of the electrolyte are high.
• To limit automatic battery decharge during periods of inactivity store the machine in environments with temperatures lower than a 30°C.

7.2.13.3 Battery charger: TRACTION battery recharge.

Explosive gas is originated during battery charging process; therefore, charging must take place in airy rooms where no risks of fire and explosion exist and in the presence of fire extinguishers.

WARNING!! After charging, when the battery charger is still connected, the electrolyte density values should range from 1.260 to 1.270 g/l (at 25°C).

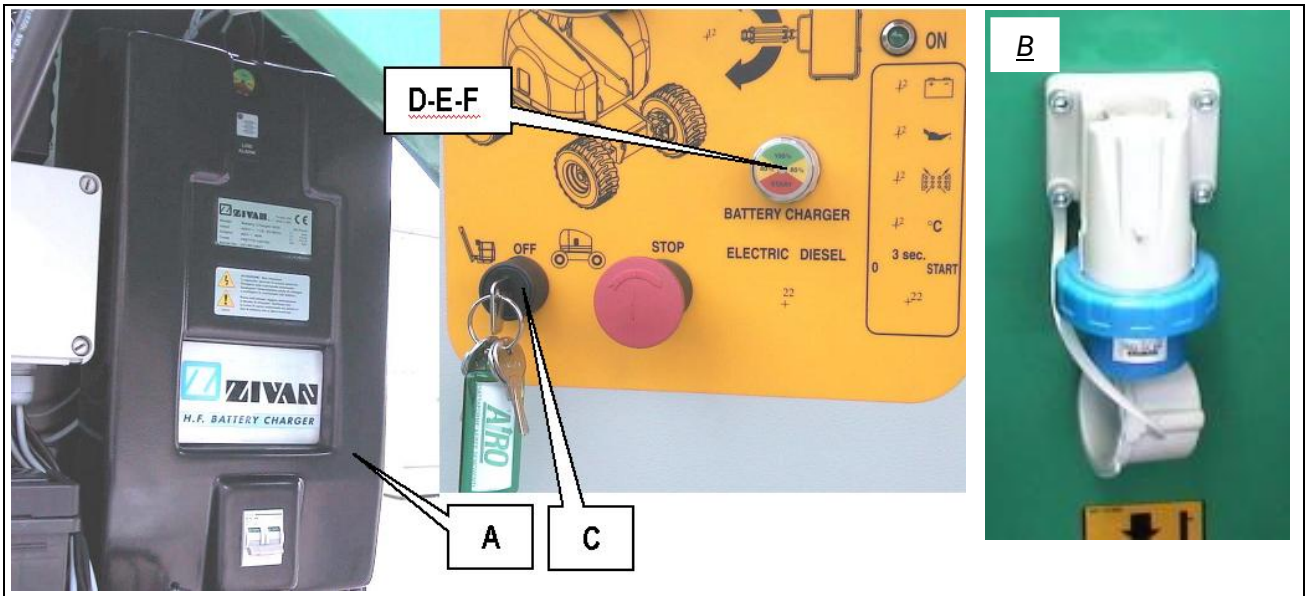


fig.32

A Battery charger
B Single phase wall plug
C On-off switch
D Red LED charge check indicator (Start)
E Yellow LED charge check indicator (80%)
F Green LED charge check indicator (100%)
G Internal fuse

To use the battery charger follow this procedure:

- § connect the battery charger by means of plug B to a 220V/230V 50Hz/60Hz socket, equipped with all protections according to the current standards in force and check that the earth-leakage circuit breaker switch is in ON position;
- § set the on-off switch C located on the on-ground control post to OFF position (machine off), checking the battery charger connection by means of LED D (if it is on, connection is on-line);
- § If LED E (yellow) lights up, battery charger is approximately 80%;
- § If LED F (green) lights up, battery charge is over. The battery charger automatically turns off;

To disconnect the 220V power supply two alternatives are possible:

- Disconnect the 220V socket from plug B located on the chassis;
- Start the machine with switch C in Start position (the battery charger is automatically disconnected).

CAUTION!
At the end of recharge remove the battery charger supply cord before starting machine operations.

7.2.13.3.1 Battery charger: fault report.

An intermittent audible signalling and the flashing LED on the battery charger indicator described in the previous paragraph indicate that a warning situation has occurred:

Signalling	Alarm type	Problem description and troubleshooting
Audible signalling + flashing RED	Battery presence	Battery is disconnected or faulty (check connection and the rated voltage of the battery).
Audible signalling + flashing YELLOW	Thermal probe	Thermal probe is disconnected during charging or outside working range (check probe connection and measure battery temperature).
Audible signalling + flashing GREEN	Timeout	Phase 1 and/or Phase 2 of duration higher than the max. allowed value (check battery capacity).
Audible signalling + flashing RED-YELLOW	Battery Current	Loss of output current control (fault in control logic).
Audible signalling + flashing RED-GREEN	Battery Voltage	Loss of output voltage control (battery disconnected or fault in the control logic).
Audible signalling + flashing RED-YELLOW-GREEN	Thermal	Overtemperature of semiconductors (check the fan operation).

CAUTION!
In presence of alarm the battery charger stops the current delivery.

7.2.14 attery replacement.

Replace the old batteries only with models of the same voltage, capacity, dimensions and weight.
Batteries must be approved by the manufacturer.

AS THIS OPERATION IS VERY IMPORTANT IT IS TO BE CARRIED OUT BY SPECIALIZED TECHNICIANS ONLY.

CALL THE TECHNICAL SUPPORT

8 MARKS AND CERTIFICATIONS.

The models of self-propelled aerial platform described in this manual were subject to the CE type test according to the EEC Directive 98/37/EC.
The certification was issued by:

I.C.E.P.I Srl Via P. Belizzi, 29/31/33 29100 Piacenza ITALIA	

Test carrying out is shown by the above plate with CE mark applied on the machine and by the declaration of conformity enclosed in this user manual.

9 CONTROL REGISTER.

The control register is released to the user of the platform in conformance with Attachment 1 of Directive 89/392/EEC, according to the integration required by Directive 91/368/EEC.
This register is to be considered an integral part of the equipment and must accompany the machine for its entire life until its final disposal.

The register is provided for the notation, according to the proposed format, of the following events that regard the life of the machine:

- Periodic obligatory inspections under the care of the agency responsible for checking it (in Italy, the A.S.L.).
- Obligatory periodic inspections to verify the structure, proper machine functioning and the protection and safety systems. Such inspections are the responsibility of the safety manager of the company that owns the machine and must occur with ANNUAL frequency.
- Transfers of Ownership. In Italy, the purchaser must notify the ISPESL department responsible that the installation of the machine has occurred.
- Extraordinary maintenance work and replacement of important elements of the machine.

REQUIRED PERIODIC INSPECTIONS BY THE REGULATORY AGENCY		
Date	Observations	Signature + Stamp

REQUIRED PERIODIC INSPECTIONS BY THE OWNER

CHECK	*DESCRIPTION OF OPERATIONS TO BE PERFORMED*
♦ Visual check	Check the integrity of the guardrails; of any access stairs; rust; state of the tyres; oil leaks; locking pins on the structure.

	Date	Observations	Signature + Stamp
1° Year			
2° Year			
3° Year			
4° Year			
5° Year			
6° Year			
7° Year			
8° Year			
9° Year			
10° Year			

♦ Various adjustments	See chapter 7.2.1

	Date	Observations	Signature + Stamp
1° Year			
2° Year			
3° Year			
4° Year			
5° Year			
6° Year			
7° Year			
8° Year			
9° Year			
10° Year			

REQUIRED PERIODIC INSPECTIONS BY THE OWNER

CHECK	*DESCRIPTION OF OPERATIONS TO BE PERFORMED*
♦ Deformation of tubes and cables	Most of all, check at junction points that tubes and cables do not show any evident defects.

	Date	Observations	Signature + Stamp
1° Year			
2° Year			
3° Year			
4° Year			
5° Year			
6° Year			
7° Year			
8° Year			
9° Year			
10° Year			

♦ Greasing (monthly operation; confirm that it was carried out at least once a year).	♦ See chapter 7.2.2

	Date	Observations	Signature + Stamp
1° Year			
2° Year			
3° Year			
4° Year			
5° Year			
6° Year			
7° Year			
8° Year			
9° Year			
10° Year			

REQUIRED PERIODIC INSPECTIONS BY THE OWNER

CHECK	*DESCRIPTION OF OPERATIONS TO BE PERFORMED*
♦ Stickers and plates check (monthly operation; confirm that it was carried out at least once a year)	Check the legibility of the aluminium plate on the platform where the main instructions are summarised; that the capacity stickers are on the platform and that they are legible; that the stickers on the ground and platform control stations are legible.

	Date	Observations	Signature + Stamp
1° Year			
2° Year			
3° Year			
4° Year			
5° Year			
6° Year			
7° Year			
8° Year			
9° Year			
10° Year			

♦ Total oil change in hydraulic tank and traction and turret rotation reduction gears (EVERY TWO YEARS)	See chapters 7.2.3, 7.2.5.

	Date	Observations	Signature + Stamp
2° Year			
4° Year			
6° Year			
8° Year			
10° Year			

REQUIRED PERIODIC INSPECTIONS BY THE OWNER

CHECK	*DESCRIPTION OF OPERATIONS TO BE PERFORMED*
♦ Hydraulic filter cleaning / replacing (EVERY TWO YEARS)	See chapter 7.2.4

	Date	Observations	Signature + Stamp
2° Year			
4° Year			
6° Year			
8° Year			
10° Year			

♦ Air removal from oscillating axle locking cylinders (only on machines equipped with oscillating axle)	♦ See chapter 7.2.6

	Date	Observations	Signature + Stamp
1° Year			
2° Year			
3° Year			
4° Year			
5° Year			
6° Year			
7° Year			
8° Year			
9° Year			
10° Year			

REQUIRED PERIODIC INSPECTIONS BY THE OWNER

CHECK	*DESCRIPTION OF OPERATIONS TO BE PERFORMED*
♦ Operation check of the turret inclinometer	♦ See chapter 7.2.8

	Date	Observations	Signature + Stamp
1° Year			
2° Year			
3° Year			
4° Year			
5° Year			
6° Year			
7° Year			
8° Year			
9° Year			
10° Year			

♦ Telescopic boom sliding blocks clearance adjustment	♦ See chapter 7.2.7

	Date	Observations	Signature + Stamp
1° Year			
2° Year			
3° Year			
4° Year			
5° Year			
6° Year			
7° Year			
8° Year			
9° Year			
10° Year			

REQUIRED PERIODIC INSPECTIONS BY THE OWNER

CHECK	*DESCRIPTION OF OPERATIONS TO BE PERFORMED*
♦ Platform overload controller check	♦ See chapter 7.2.9

	Date	Observations	Signature + Stamp
1° Year			
2° Year			
3° Year			
4° Year			
5° Year			
6° Year			
7° Year			
8° Year			
9° Year			
10° Year			

♦ Operation check of microswitches M1	♦ See chapter 7.2.10

	Date	Observations	Signature + Stamp
1° Year			
2° Year			
3° Year			
4° Year			
5° Year			
6° Year			
7° Year			
8° Year			
9° Year			
10° Year			

REQUIRED PERIODIC INSPECTIONS BY THE OWNER

CHECK	*DESCRIPTION OF OPERATIONS TO BE PERFORMED*
♦ Operation check of dead-man pedal safety system	See chapter 7.2.11

	Date	Observations	Signature + Stamp
1° Year			
2° Year			
3° Year			
4° Year			
5° Year			
6° Year			
7° Year			
8° Year			
9° Year			
10° Year			

CHECK	*DESCRIPTION OF OPERATIONS TO BE PERFORMED*
♦ Battery condition (Electric models –E)	See chapter 7.2.12, 7.2.13

	Date	Observations	Signature + Stamp
1° Year			
2° Year			
3° Year			
4° Year			
5° Year			
6° Year			
7° Year			
8° Year			
9° Year			
10° Year			

REQUIRED PERIODIC INSPECTIONS BY THE OWNER

CHECK	*DESCRIPTION OF OPERATIONS TO BE PERFORMED*
♦ Braking system efficiency check	Going down a ramp with max. slope indicated in chapter “Technical features”, at the lowest speed, the machine should be able to stop, upon release of the joystick, in a space of less than 1.5 meters

	Date	Observations	Signature + Stamp
1° Year			
2° Year			
3° Year			
4° Year			
5° Year			
6° Year			
7° Year			
8° Year			
9° Year			
10° Year			

♦ Emergency manual controls check	♦ See chapter 5.6

	Date	Observations	Signature + Stamp
1° Year			
2° Year			
3° Year			
4° Year			
5° Year			
6° Year			
7° Year			
8° Year			
9° Year			
10° Year			

TRANSFERS OF OWNERSHIP

FIRST OWNER

Company	Date	Model	Serial Number	Date of Delivery

AIRO – Tigieffe S.r.l.

SUBSEQUENT TRANSFERS OF OWNERSHIP

Company	Date

We affirm that, as of the date quoted above, the technical, dimensional and functional characteristics of this machine were in conformance with what was originally required and that any changes have been recorded in this register.

The Seller The Purchaser

SUBSEQUENT TRANSFERS OF OWNERSHIP

Company	Date

We affirm that, as of the date quoted above, the technical, dimensional and functional characteristics of this machine were in conformance with what was originally required and that any changes have been recorded in this register.

The Seller The Purchaser

SUBSEQUENT TRANSFERS OF OWNERSHIP

Company	Date

We affirm that, as of the date quoted above, the technical, dimensional and functional characteristics of this machine were in conformance with what was originally required and that any changes have been recorded in this register.

The Seller The Purchaser

IMPORTANT BREAKDOWNS

DATE	Description of Breakdown	Solution

Spare Parts Used		Description
Code	Quantity	

Service

Safety Manager

DATE	Description of Breakdown	Solution

Spare Parts Used		Description
Code	Quantity	

Service

Safety Manager

IMPORTANT BREAKDOWNS

DATE	Description of Breakdown	Solution

Spare Parts Used		Description
Code	Quantity	

Service

Safety Manager

DATE	Description of Breakdown	Solution

Spare Parts Used		Description
Code	Quantity	

Service

Safety Manager

IMPORTANT BREAKDOWNS

DATE	Description of Breakdown	Solution

Spare Parts Used		Description
Code	Quantity	

Service

Safety Manager

DATE	Description of Breakdown	Solution

Spare Parts Used		Description
Code	Quantity	

Service

Safety Manager

IMPORTANT BREAKDOWNS

DATE	Description of Breakdown	Solution

Spare Parts Used		Description
Code	Quantity	

Service

Safety Manager

DATE	Description of Breakdown	Solution

Spare Parts Used		Description
Code	Quantity	

Service

Safety Manager

IMPORTANT BREAKDOWNS

DATE	Description of Breakdown	Solution

Spare Parts Used		Description
Code	Quantity	

Service

Safety Manager

DATE	Description of Breakdown	Solution

Spare Parts Used		Description
Code	Quantity	

Service

Safety Manager